MEDICAL PROCEEDINGS

MEDIESE BYDRAES

A South African Journal for the Advancement of Medical Science

'n Suid-Afrikaanse Tydskrif vir die Bevordering van die Geneeskunde

P.O. Box 1010 · Johannesburg | Posbus 1010 · Johannesburg

Vol. 4 | 11 Januarie 1958 January 11 | No. 1

DIE KLOSNIER VAN DIE KOLFF-TIPE

DIALISE BUITE DIE LIGGAAM

Hoewel Abel *et al.*[1] die eerstes was wat in 1914 'n kunsmatige nier geproduseer het, het byna 30 jaar verstryk voordat Kolff en Berk[2] die eerste praktiese model tydens die Tweede Wêreldoorlog in besette Holland ontwikkel het.

Die kunsmatige nier van die Kolff-tipe word reeds gebruik in 'n verskeidenheid van noodgevalle wat kan ontstaan ondanks spesifieke terapie toegespits op die primêre oorsaak van die kwaal, bv. hoë bloeddruk gepaard met progressiewe nierbeskadiging. Dit het 'n algehele verandering teweeggebring in prognose in die ernstige krisisse van sulke toestande soos:

1. *Akute nierverswakking.*[3]

Akute buisvormige nekrose (akute buisvormige ontaarding, nekrotiserende nefrose, laer nefronnefrose);
Oortappingsreaksies;
Nierverswakking na 'n bevalling;
Die verpletteringsindroom;
Ná-chirurgiese anurie.

2. *Vergiftiging deur Dialiseerbare Middels.* (Dit is die barbiturate, die bromiede, metielsalisilaat, asetielsalisilaat en tiosianate).

Van besondere waarde is die dialise-behandeling van hierdie soort vergiftiging, want die tydperk wat nodig is om die gifstowwe tot 'n veilige peil te verminder, kan nou gemeet word in ure, in plaas van in dae en selfs in die weke wat tot dusver nodig was.

3. *Chroniese Nierversaking,* veral in die fases van bykomende akute verergering.

'n Belangrike kenmerk van uitwendige dialise met die klosnier is die vermoë om die bestaande elektrolitiese onewewigtighede terselfdertyd te verbeter deur 'n geskikte aanpassing van die dialiserende vloeistof.

1. Abel, J. J., Rowntree, L. G. en Turner, B. B. (1914): J. Pharmacol. Exper. Therap., **5**, 275.
2. Kolff, W. J. en Berk, H. T. J. (1944): Acta Med. Scandinav., **117**, 121.
3. Schreiner, G. E. (1953): Med. Ann. Dist. Columbia, **22**, 531.

THE KOLFF-TYPE COIL KIDNEY

EXTRACORPOREAL DIALYSIS

Although Abel *et al.*[1] were the first to produce an artificial kidney in 1914, it was not until nearly 30 years later that Kolff and Berk[2] evolved the first practical model during World War II in occupied Holland.

The Kolff-type of artificial kidney has already found application in a variety of emergencies which may arise despite specific therapy directed at the primary cause of the disorder e.g. hypertension with progressive renal damage. It has completely altered the prognosis in the grave crises of such conditions as:

1. *Acute Renal Insufficiency.*[3]

Acute tubular necrosis (acute tubular degeneration, necrotizing nephrosis, lower nephron nephrosis);
Transfusion reactions;
Post-partum renal insufficiency;
The crush syndrome;
Post-surgical anuria.

2. *Poisoning with Dialyzable Drugs.* (These are the barbiturates, bromides, methyl salicylate, acetyl salicylate, thiocyanates).

Of particular value is the dialysis treatment of this type of poisoning, because the period necessary to reduce these poisons to a safe level may now be measured in hours instead of the days and even weeks which have been necessary until now.

3. *Chronic renal failure,* especially in the phases of a supervening acute exacerbation.

An important feature of external dialysis with the coil kidney is the ability at the same time to correct existing electrolyte imbalances

1. Abel, J. J., Rowntree, L. G. and Turner, B. B. (1914): J. Pharmacol. Exper. Therap., **5**, 275.
2. Kolff, W. J. and Berk, H. T. J. (1944): Acta Med. Scandinav., **117**, 121.
3. Schreiner, G. E. (1953): Med. Ann. Dist. Columbia, **22**, 531.

Soos Morris en Moyer[4] sê:

‚Kunsmatige dialise moet altyd beskou word slegs as 'n toevoegsel tot die goeie konserwatiewe bestuur van sowel akute as chroniese nierversaking. Dit is nie 'n plaasvervanger vir goeie mediese behandeling nie. By die behandeling van 'n pasiënt wat aan nierversaking ly, moet 'n geïndividualiseerde skets van die bestuursplanne opgestel word. Kunsmatige dialise het dus 'n spesifieke indikasiepunt in die hooftrekke van die terapie, na gelang van die kliniese beeld en die verloop van omstandighede. Aan die ander kant moet dit nie uitgestel word totdat alle ander behandelingsmaniere misluk het en die geval hopeloos is nie.'

In sy jongste vorm is die dialise-meganisme 'n verbruikbare kloseenheid.[5, 6] Die konstruksie van hierdie tipe klosnier bring sekere meganiese voordele mee wat die nadele verbonde aan ander vorms van die kunsmatige nier uit die weg ruim. Die volledige dialise-eenheid (insluitende die slagaderlike inlaatstel en die aderlike uitlaatstel) word steriel en pirogeen-vry verskaf, en is verbruikbaar. Temeer, dit kan binne enkele minute geïnstalleer en binne enkele minute vervang word selfs *gedurende die dialise-tydperk.*

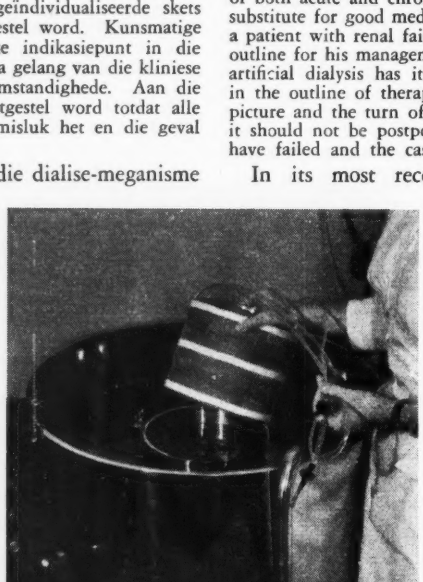


Fig. 1. 'n Assistent staan gereed om die verbruikbare tweelingklosse sellulose-buis (wat soos 'n verband rondom 'n metaalsilinder gewikkel is) in die binne-houer te plaas.

Fig. 1. An assistant is ready to place the disposable twin coils of cellulose tubing (wrapped like a bandage around a metal cylinder) into the inner container.

BEGINSELS VAN DIALISE

Die probleem is om 'n voldoende groot hoeveelheid bloed binne 'n voldoende kort tydperk te dialiseer. Dit word gedoen sonder om aan die nier self verby te gaan. 'n Betreklike klein volume bloed word vinnig deur die kunsmatige nier gesirkuleer om die kristalloïede en die water wat die verswakte nierorgane nie by means of suitable adjustment of the dialyzing fluid.

As Morris and Moyer[4] have pointed out:

'Artificial dialysis should always be considered only as an adjunct to good conservative management of both acute and chronic renal failure. It is not a substitute for good medical management. In treating a patient with renal failure, a detailed individualized outline for his management should be set up. Thus, artificial dialysis has its specific point of indication in the outline of therapy, depending on the clinical picture and the turn of events. On the other hand, it should not be postponed until all other measures have failed and the case is hopeless.'

In its most recent form, the dialyzing mechanism is an expendable coiled unit.[5, 6] This type of coil kidney has certain mechanical advantages in its construction which overcome the drawbacks inherent in other forms of artificial kidney. The complete dialyzing unit (including the arterial inlet set and the venous outlet set) is supplied sterile, pyrogen-free and is expendable. Moreover, it can be installed within minutes and replaced within minutes even *during the period of dialysis.*

PRINCIPLES OF DIALYSIS

The problem is to dialyze a sufficiently large volume of blood in a sufficiently short time. This is done without by-passing the kidney. A relatively small volume of blood is rapidly circulated through the artificial kidney, thus separating crystalloids and water which the impaired renal organs cannot handle ade-

4. Morris, G. C. en Moyer, J. H. (1957): GP, **15**, 103.
5. Kolff, W. J. en Watschinger, B. (1956): J. Lab. Clin. Med., **47**, 969.
6. Kolff, W. J., Watschinger, B. en Vertes, U. (1956): J. Amer. Med. Assoc., **161**, 1433.

4. Morris, G. C. and Moyer, J. H. (1957): GP, **15**, 103.
5. Kolff, W. J. and Watschinger, B. (1956): J. Lab. Clin. Med., **47**, 969.
6. Kolff, W. J., Watschinger, B. and Vertes, U. (1956): J. Amer. Med. Assoc., **161**, 1433.

op 'n doeltreffende wyse kan behandel nie, van mekaar te skei. Die uitwendige dialise geskied gelyktydig met die nierdialise, maar deur die verwydering van die las wat opgeloste stowwe vir die niere meebring, word natuurlike herstel van hierdie organe in die hand gewerk in soverre so iets natuurlik moontlik is.

In die geval van sekere soorte vergiftiging is dit egter die funksie van die kunsmatige nier om die giftstowwe so vinnig as moontlik uit die bloedsomloop te verwyder—'n taak wat die liggaam self nie gou genoeg kan volbring nie.

Die dialise-oppervlakte van die kunsmatige nier is ongeveer 19,000 vierkante sentimeter en tog is net 600–900 ml. bloed nodig om dit te vul. Dit is 'n belangrike faktor by die oorweging van die koste en die gevare van dialise.

Die dialise-oppervlakte word verskaf deur die tweeling-dialise-eenheid (Tekening 1), bestaande uit twee lengtes parallelle sellulose-buis, elk 10.75 meter lank en, as hulle plat is, 4.5 sm. breed.

Bloed van die pasiënt (versamel òf uit die armslagaar òf uit die onderste holaar) word deur 'n Sigma-motorpomp in die twee parallelle buise ingepomp (Tekening 2) sodat bloedstrome wat min of meer gelyk is deur elke seksie van die dialise-eenheid gaan. Die bloed verlaat die eenheid deur die buise in die rand, vloei deur twee filterkamers (wat ook alle lugborreltjies voorkeer), en keer dan terug na die pasiënt se aar.

Die dialise-vloeistof (in 'n tenk van 100 liter) word termostaties op 'n temperatuur van 39°C. gehou. Die pH daarvan word deur 10% CO_2 in suurstof op 7.4 gehou; dit word deur

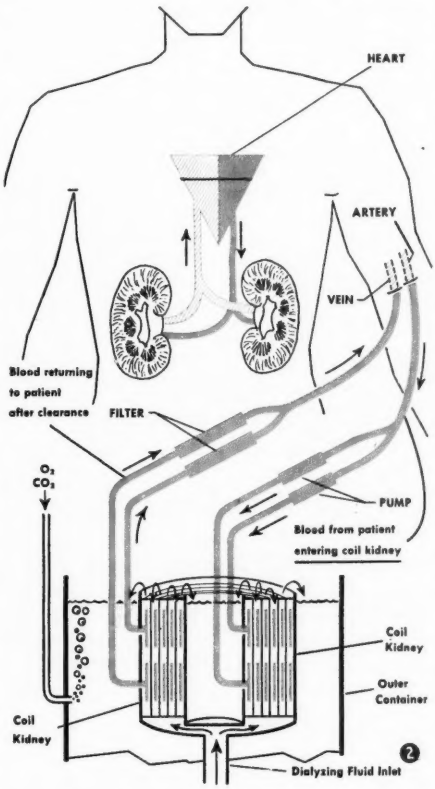


Fig. 2. Tekening van 'n klosnier van die Kolff-tipe vasgeheg aan 'n pasiënt.

Fig. 2. Diagram of the Kolff-type coil kidney attached to the patient.

quately. The external dialysis proceeds concurrently with renal dialysis, but by removing the solute load from the kidneys, natural repair of these organs is permited—in so far as this can be done.

In certain types of poisoning, however, the function of the artificial kidney is to clear the poisons sufficiently rapidly from the circulation—a task which the body itself cannot accomplish quickly enough.

The dialyzing area of the artificial kidney is about 19,000 square cm., yet it only requires 600–900 ml. of blood for priming. This is an important factor in the consideration of the cost and the hazards of dialysis.

The dialyzing area is provided by the twin dialyzing unit (Fig. 1) which consists of two lengths of cellulose tubing in parallel, each 10.75 metres long and, when flat, 4.5 cm. wide.

Blood from the patient (collected either from the brachial artery or the inferior vena cava) is pumped through a Sigma motor pump into two parallel tubes (Fig. 2) so that a substantially equal flow of blood passes through each section of the dialyzing unit. The blood leaves the unit through tubes in the periphery, flows through two filter chambers (which also serve to trap any air bubbles) and then returns to the patient's vein.

The dialyzing fluid (in a 100 litre tank) is thermostatically maintained at a temperature of 39°C. Its pH is kept at 7.4 by 10% CO_2 in oxygen, bubbled through the fluid through a special inlet.

The dialyzing fluid is forced through the inner container by means of a circulating

'n spesiale inlaatplek deur die vloeistof geborrel.

Die dialise-vloeistof word deur die binnehouer gedwing met behulp van 'n sirkulasiepomp, en gaan dan tussen die opgekrulde sellofaanbuise en die veselglasskerms deur.

As dit nodig is om die vloeistof tydens dialise te verander, kan die hele proses tydelik stopgesit word onderwyl die tenk met vars dialise-vloeistof gevul word.

Die isotoniese dialise-vloeistof is kraanwater waarby NaCl, $NaHCO_3$, KCl, $CaCl_2$ en $MgCl_2$ gevoeg is, tesame met 0.4% invertsuiker. Die oplossing word met melksuiker tot pH 7.4 gebring.

Die klosnier het 'n hoë funksionele doeltreffendheid. In die praktyk is soveel soos 503 g. ureum oor 'n tydperk van 4–6 uur verwyder.[5]

Omdat die dialise onder hidrostatiese druk geskied, is daar die groot voordeel dat water sowel as vaste stowwe verwyder kan word. Filtrasie deur 'n klosnier van die Kolff-tipe is derhalwe veel beter as dialise alleen waarop ander kunsmatige niersoorte uitsluitend staat maak.

Ten slotte is die belangrikste praktiese kenmerk van die klosnier van die Kolff-tipe sy redelike en lae prys. Dit beteken dat dit selfs deur middelmatig groot inrigtings aangeskaf kan word.

pump and passes between the coiled cellophane tubing and the fibreglass screens.

If the fluid needs to be changed during dialysis, the whole process can be stopped temporarily while the tank is refilled with fresh dialyzing fluid.

The isotonic dialyzing fluid is tap water to which NaCl, $NaHCO_3$, KCl, $CaCl_2$ and $MgCl_2$ have been added, together with 0.4% invert sugar. The solution is adjusted to pH 7.4 with lactic acid.

The functional efficiency of the coil kidney is considerable. In actual performance up to 503 g. of urea have been removed over a period of 4–6 hours.[5]

Because the dialysis proceeds under hydrostatic pressure, there is the distinct advantage that water as well as solids can be removed. Filtration through the Kolff-type coil kidney is therefore superior to mere dialysis, as relied upon exclusively in other types of artificial kidney.

Finally, a most important practical feature of the coil kidney is its reasonable and low cost. This means that it can be acquired even by institutions of very moderate size.

THE 1957 INFLUENZA EPIDEMIC*

The influenza epidemic that started in Asia and spread in a few months to both hemispheres, has for several reasons put epidemiologists and health authorities on their mettle.

While remaining mild, it has a tendency to spread that is accounted for by the characteristics of the virus concerned, which differs considerably from those responsible for the epidemics of the last 25 years. Although it belongs to the A virus group, it is the most aberrant type reported since the discovery of the influenza virus in 1933. Antigenic variants of the A virus are known to have appeared during previous epidemics, but in recent years these variations have been fairly slight. Nevertheless, wide differences in antigenic constitution have occasionally been observed as for instance, in 1946–47, with the appearance of the strains classified as A/FM1/47, first isolated in Australia (strain A/CAM/46). The deviations observed in the 'new' virus—designated for the time being A/Asia/57—are more pronounced than any so far observed, even including these marked ones of 1946–47. Since most population groups have never been in contact with the virus, and consequently have no acquired immunity to it, the advance of the epidemic is meeting with little resistance.

EPIDEMIOLOGY

The first notifications, reporting the presence of numerous influenza cases, were sent to WHO from Singapore on 4 May 1957. However, as was afterwards discovered, the epidemic had already been spreading for several weeks. It started in the north of China at the beginning of the spring and penetrated into the interior of the country, where the virus was isolated for the first time at Peking, in March. Cases next appeared at Hong Kong in the middle of April. The gaps existing in what should be a world-wide system of epidemiological notification have become painfully apparent on this occasion.

During May, June and July, the epidemic spread very rapidly to the Philippines and Japan, South-East Asia, and the Western Paci-

* A Review published in the Chronicle of the World Health Organization, 1957, **11**, 269.

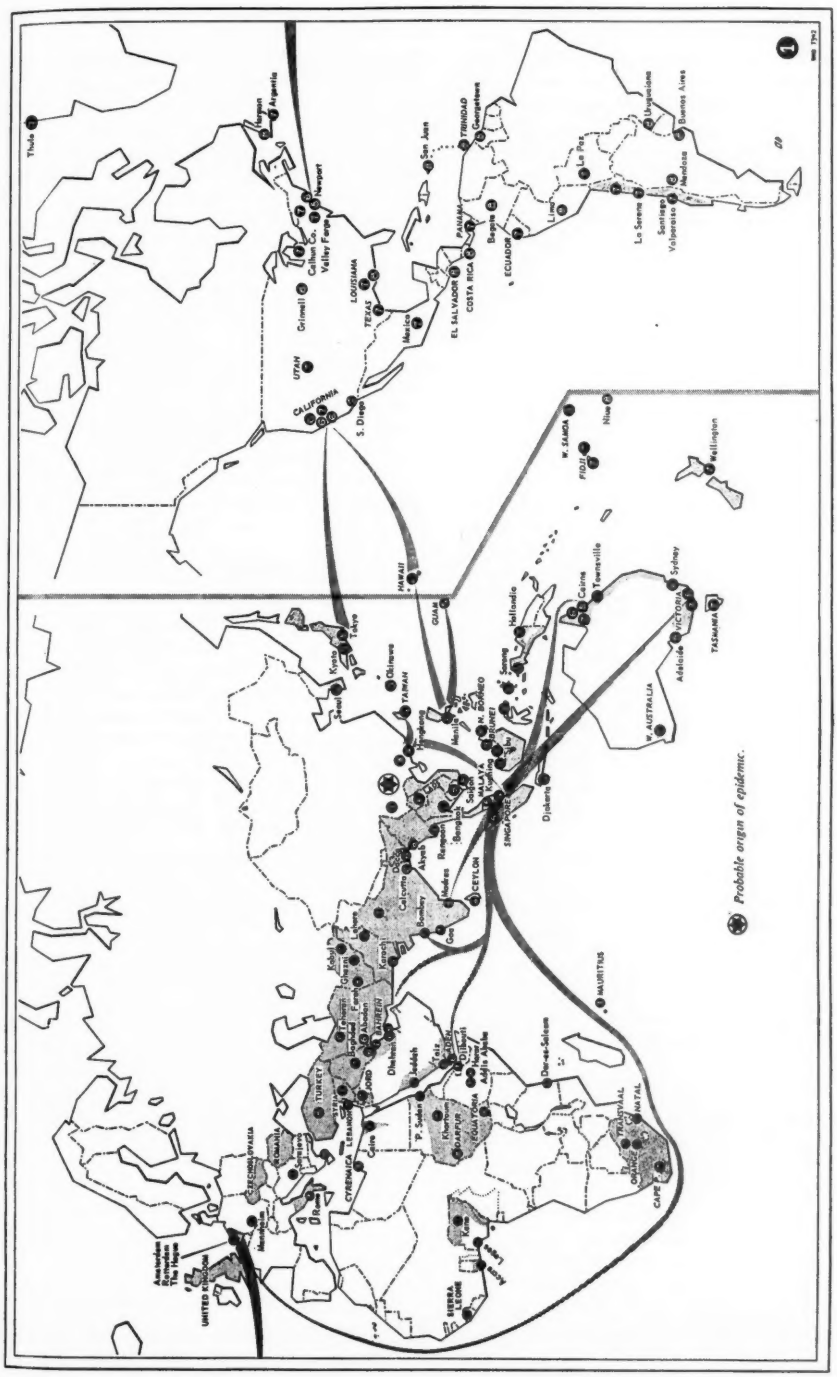


Fig. 1. Progress of the Influenza Epidemic from February to 31 August 1957. The shading shows the regions most affected. The figures represent the months when the first cases appeared.

fic; then on to India, the Persian Gulf, Iran, Yemen, Aden, the Sudan, Egypt, Syria, Jordan and Australia. During the month of August, foci appeared in North, Central and South America, Europe and certain parts of Africa (Fig. 1). The epidemic spread most of all in very dense communities, where contact between individuals was easy and frequent. Thus, in Japan and the Netherlands, for example, schools and camps were particularly affected, the number of cases sometimes being as high as 60% of the total number of pupils. On board ship, too, series of cases have developed and have spread subsequently to ports and their hinterland. It would seem that these massive influxes of infected persons have played a bigger part in the spread of the infection than isolated cases transported by air.

In the northern hemisphere, influenza is not generally a summer disease, and this seems to be confirmed by the present epidemic, since in recent months it has not spread in Europe or the U.S.A. to the extent which might have been feared. In tropical countries, on the other hand, there is no such marked seasonal periodicity; but, in fact, very little is yet known concerning influenza epidemiology in these regions and there is no clear explanation why the infection spread there and yet seemed unable to spread in the northern summer.

In the southern hemisphere the influenza season begins as a rule in June, the highest incidence being reached during the following two or three (winter) months. This year, the virus was carried south of the equator during the most favourable season, but the epidemic did not spread as rapidly as might have been expected and the proportion of people affected appears to be lower than in some tropical areas.

The disease appeared in Australia in May and was still spreading in June. Early in July it reached the Union of South Africa and Chile, and during August it was spreading in Argentina, Southern Brazil and New Zealand.

CLINICAL CHARACTERISTICS

This epidemic, which has remained mild, has caused very few deaths, and these have been due for the most part to bacterial pulmonary complications. In a few areas, the Philippines, for example, a fairly high death rate has been reported. It is difficult, however, in the absence of laboratory diagnoses for the majority of the cases, to distinguish between deaths due specifically to influenza and those caused by other diseases resembling influenza in certain symptoms.

THE VIRUS

The virus responsible for the epidemic is shown by the complement-fixation test to belong to the A virus group. However, it gives no cross reaction with the viruses of this group in the much more specific haemagglutination-inhibition test. It is quite distinct from any of the viruses which have caused epidemics in the last 25 years, and shows the most important deviation in antigenic composition observed among viruses since 1933. Recently, Professor Mulder found in the Netherlands—and other workers in the United States of America and Australia have confirmed this—that some persons over 70 years of age possess antibodies against the 'new' virus. It is not inconceivable that virus A/Asia/57 is related to the one which caused the 1889 pandemic. If this is confirmed, it may prove to be a fundamental advance in our understanding of the epidemiology of influenza.

VACCINATION

Experiments in influenza vaccination have been carried out in certain communities for some 20 years past, using the allantoic fluid from the hen's egg infected with influenza virus and then inactivated with formol. While duly recognizing the variability in the results observed in certain cases, Dr. T. Francis, jr., still felt able to affirm that

'vaccination against influenza has been shown to be uniformly effective under a variety of conditions, when vaccines of proper constitution and potency are employed'.[1]

The decisive part played by the components of the vaccine and their antigenic power has been stressed by Dr. von Magnus in the following words:

'Studies of the antigenic variations among influenza viruses are of importance not only for a better understanding of the epidemiology of the disease, but also for problems associated with the procuring of an effective vaccine against it. It has been clearly established that a vaccine made from strains which differed considerably from the epidemic strain in question did not protect against the disease'.[2]

There can be no question of claiming to stop an epidemic by vaccinating against influenza. What is aimed at is the limitation of its effects

[1]Francis, T., jr. (1954): *Vaccination against Influenza.* In: *Influenza—A Review of Current Research,* Geneva, p. 125 (*World Health Organization Monograph Series,* No. 20).

[2]Magnus, P. von (1954): *The Influenza Virus: Its Morphology, Immunology and Kinetics of Multiplication.* In: *Influenza—A Review of Current Research,* Geneva, p. 55 (*World Health Organization Monograph Series,* No. 20).

by preventing high death rates and excessive absenteeism, such as would disorganize the public services and bring society to a standstill. Certain groups should be given priority. First, the medical services must be fit so that they may tend the sick; while there is no specific treatment for influenza itself, most deaths are caused by the bacterial complications of influenza—principally pneumonia—and the antibiotic treatment available to-day makes it possible, when it is given in time, to keep mortality down to a minimum. Next, the personnel essential for the proper running of the public services and basic industries must also be protected.

The first strains of virus A/Asia/57, as soon as isolation was achieved, were sent by the World Influenza Centre and the International Influenza Centre for the Americas to firms and laboratories preparing vaccines. Their task is to study the possibility of preparing a specific vaccine against this epidemic, so as to be able to meet possible requirements in the near future.

Information reaching WHO regarding the suitability of the 'new' virus for use as a vaccine is so far not very encouraging. According to the initial analyses carried out in manufacturing laboratories, national centres, and the World Influenza Centre, the virus has very little antigenic potency. Even a strain which appears to grow to a satisfactory concentration in eggs—as judged by the CCA (chicken-cell agglutination) titre—stimulates the formation of very little antihaemagglutinating antibody in man. This may be due in part to the fact that most people have had no previous experience of this virus and that the vaccine is therefore acting as a primary stimulus. If this is so, it seems unlikely that a single dose would be sufficient to produce satisfactory immunization in man. Vaccination by inactivated vaccines, such as those employed in recent years, has the drawback of requiring a considerable amount of culture material (up to one egg per vaccine dose or even more in the case of strains with little antigenic potency). An attempt is therefore being made to develop an attenuated live vaccine. The doses required would then be smaller, since the vaccine multiplies in the body.

At an unofficial meeting of some eminent virologists, held at the suggestion of WHO following the recent International Poliomyelitis Conference at Geneva, a new vaccination procedure described by Soviet workers was discussed. With this procedure, the virus strain, after an initial egg passage, is cultured on human embryo tissue (where it undergoes a change in virulence), and then again cultured in the egg. The allantoic fluid, either liquid or dried, is sprayed into the nasal passages. In children this may give rise to a mild attack of influenza. The effectiveness of this method is still a matter of controversy.

The low antigenicity of the virus has also led to the failure so far of experiments in prophylaxis with hyperimmune serum. This is prepared by immunizing horses, and the serum is then sprayed into the nasal passages, as in the technique mentioned above. Injection of the Asian virus into the horse has brought about the formation of little or no antibody, certainly insufficient for effective protection.

POSSIBLE RELATIONSHIP BETWEEN HUMAN INFLUENZA AND SWINE INFLUENZA

Shortly after the influenza pandemic of 1918 a similar disease, called 'swine influenza', broke out among pigs in the Middle West of the United States of America. It now takes the form in a few States of winter epidemics of a mixed infection of virus and *Haemophilus suis*. In the inter-epidemic periods, the virus is not found in the tissues of the pigs. However, earthworms taken from infected pig farms seem to carry inapparent viruses, and these can develop in pigs eating the worms, into normal viruses capable of being isolated from the respiratory system. The question therefore arises whether the pigs are in fact the virus reservoirs, rather than being secondarily infected by the human virus, as some have maintained. The occasion of the present epidemic is to be used to attempt to find out whether animals actually play a part in influenza epidemiology. Sera taken from pigs, horses and other animals in regions so far unaffected by the epidemic are to be submitted to serodiagnostic tests, so that later on sera from the same animals can be studied and the antibodies compared, using the same tests, if the epidemic breaks out in these areas. In this connexion, WHO has appealed to the veterinary and public health services of a number of countries in different parts of the world to undertake this research in collaboration with the WHO influenza centres.

OPSOMMING

Die influensa-epidemie van 1957 wat in Asië begin het, word in oënskou geneem.

Die epidemiologie, die kliniese kenmerke, die virus, en 'n entstof teen influensa word bespreek.

Die verslag handel ook oor 'n moontlike verwantskap tussen influensa by die mens en influensa by varke.

OSTEOCHONDRITIS DISSECANS OF THE MEDIAL FEMORAL CONDYLE

L. H. MULLER, M.B., CH.B.

Department of Orthopaedics, Pretoria General Hospital, Pretoria

Osteochondritis dissecans is a condition in which a fragment of articular cartilage and bone becomes partially or completely separated from the parent bone. One of the most frequently affected sites is the medial femoral condyle. The commonest location in the anteroposterior plane, as seen in the lateral roentgenograms, is just posterior to a line bisecting the shaft of the femur and the epiphyseal plate. This represents the approximate mid-point of the distal articulating surface of the epiphysis, which is the weight-bearing area when the knee is extended.[7]

Bilateral symmetrical lesions of the medial femoral condyle, as well as lesions of the lateral condyle and lesions in other positions on the medial condyle are described.

It is the purpose of this paper to consider an abnormality of the medial meniscus of the knee joint as a causative factor, and to discuss the effect that this abnormality may have on the treatment of the condition.

THEORIES OF ETIOLOGY

The various theories suggested to explain the occurrence of the lesions may be divided into 3 groups.

1. Pure and simple trauma.
2. Trauma followed by some pathological process.
3. Non-traumatic theories.

1. PURE AND SIMPLE TRAUMA

This theory receives the support of most writers. The following mechanisms have been described to explain the nature of the mechanical forces involved:

(*a*) *Impaction of the Patella against the Femoral Condyle.* Burckhardt[14] believes that the patella, as a result of fixation by the quadriceps, is pushed with great force against the underlying structures. The amount of this force is calculated according to mechanical laws, and it can be shown that sufficient force is derived from contraction of the quadriceps extensor muscle to produce a fracture.

Schmidt[14] claims that condylar fragments are broken off by impact between the patella and the condyle following sudden rotation of the leg when in flexion.

Brackett[4] cites a case of the typical lesion resulting from a severe blow on a fully flexed knee, and calls attention to the fact that many of his patients followed occupations involving an excessive amount of kneeling.

Hellström[8] also blames the patella, believing the lesion to be an incomplete fracture resulting from repeated minor traumata, the damage occurring when the joint is flexed.

(*b*) *Impaction of the Tibial Spine against the Femoral Condyle.* Richards[11] wrote that in a case where the lesion was found in both knees of the subject, the medial tubercle of the tibial spine was elongated, thus suggesting a purely local process due to this peculiarity. There are two ways in which this tubercle may be forced against the medial condyle, viz. by rotation of the tibia on the femur (or *vice versa*) or by an external shearing force driving the tibia inwards or the femur outwards.

Roesner[14] favours the rotation theory, but speaks of the involuntary rotation, i.e. external rotation, which takes place just before extension is completed.

Fairbank[4] found that as a rule impingement of the tibial spine against the inner condyle was produced by internal rotation of the tibia on the femur.

Smillie[12] is convinced of the traumatic theory, and when the lesion is situated at the typical site, single or repeated impingements of the tibial spine against the medial condyle are held responsible.

(*c*) *Impingement of the Condyle against a Torn Meniscus.* Smillie[12] cannot reconcile an atypically situated lesion at the centre of the articular surface of one or other condyle with impingement of the tibial spine. In his view this is mechanically impossible. A torn meniscus is, in his opinion, invariably present, and two types of tear are cited:

i. A longitudinal tear with the central portion displaced towards the centre of the joint; or

ii. The combination of a longitudinal with a transverse tear resulting in a hypertrophied

tag of meniscus, based anteriorly, and projecting towards the centre of the joint.

(*d*) *Direct Injury.* In these cases the areas which are most vulnerable to direct injury, i.e. the peripheral margins of the femoral condyles are affected. Smillie[12] explains these on the basis of a rotatory force which twists a major portion of articular cartilage and subchondral bone from the weight-bearing surface of the femoral condyle.

(*e*) *Pull of the Posterior Cruciate Ligament.* Barth[14] favours the pure traumatic theory, and suggests that the pull of this ligament is responsible.

(*f*) *Pull of the Anterior Cruciate Ligament.* Balensweig[1] believed that osteochondritis dissecans is the result of an osteochondral fracture of the external femoral condyle as a result of cross strain, aided by pull of the anterior cruciate ligament.

Glissan[6] pointed out that the attachment of this ligament is by strong fibrous bands, and that an extension of this insertion goes to the area of the medial condyle where the sequestrated fragment is found. He suggested that the pull of the ligament had the effect of devitalizing and perhaps raising a fragment of cartilage and underlying bone. He quoted several cases of this condition in subjects who had been in the habit of sitting on their feet or squatting for long periods, positions which caused a considerable stretching force on the anterior cruciate ligament.

(*g*) Several other writers support a purely traumatic theory, but they do not all agree on the mechanisms by which the injury occurs.

2. TRAUMA FOLLOWED BY SOME PATHOLOGICAL PROCESS

(*a*) *Inflammation following Trauma.* Many of the early writers, König,[14] Kragelund,[14] Timbrell Fisher,[4] Broca,[4] Teale,[4] Paget,[14] Mouchet[4] and Brucas[4] thought that the separation was the result of an inflammatory process, a 'quiet necrosis' set up by trauma.

(*b*) *Infarction Resulting from Damage to the Vessels Entering the Bone from the Intercondylar Notch.* Ludloff[9] advanced the theory that loose bodies arising from the lateral surface of the medial condyle result from injury to the middle geniculate artery at the point where it perforates the posterior capsule of the joint, and before it enters the bone at the seat of insertion of the posterior cruciate ligament. The resulting circulatory disturbance leads to necrosis of the area of bone supplied by the injured vessel.

Axenhausen[14] assumed that, as the result of impaction from the opposing articular surface, the blood vessels to the part are damaged, either with or without partial fracture, according to the severity of the violence. This leads to necrosis of the area supplied by the damaged vessels.

(*c*) Somner[14] suggests that trauma, perhaps slight and oft repeated, causes paralysis of the local vessels.

(*d*) Wollbach and Allison[16] offered the explanation that the separation was the effect of mechanical pressure on a portion of the articular cartilage, with underlying bone bridging a cyst.

3. NON-TRAUMATIC THEORIES

(*a*) Axenhausen[14] attributes the lesion to *embolic infarction* and suggests attenuated tubercle bacilli as producing the occlusion of the vessels.

(*b*) Rieger[14] suggests *fat embolism,* and states that he found actual evidence of this.

(*c*) Watson-Jones[15] considers the pathology to be that of *avascular necrosis,* but seeks an additional factor which he considers to be constitutional.

(*d*) It seems, from the cases described by Bernstein,[2] Wagoner and Cohn,[14] Gardiner[5] and Pick,[10] that there is in these cases an underlying *familial or hereditary constitutional factor.*

REVIEW OF THE LITERATURE ON TREATMENT

In regard to the treatment of those cases in which the osteochondritic fragment has already separated, no difference of opinion exists. All are agreed that the detached fragment should be removed. Some difference of opinion does exist, however, when the osteochondritic fragment has not yet separated.

Spontaneous healing without any form of treatment has been reported by Axenhausen,[14] Kappis,[14] Moreau,[4] Edelstein,[3] and van Demark.[13]

Green and Banks[7] state that in childhood conservative treatment may be expected to lead to spontaneous healing without residual deformity, and that in the majority of instances surgical intervention is not indicated.

In some of their patients the protection of the joint was accomplished by the use of Patten-ended calipers, and in another group a plaster leg cylinder was applied with the knee

in the amount of flexion which was needed to remove the pressure of weight-bearing from the lesion. The angle was determined for the individual case and was usually about 30 degrees of flexion. Those protected by Patten-ended calipers wore it for an average period of 5 months, and those who wore plaster cylinders were protected for an average of 4 months.

Fairbank[4] advises that in the presence of symptoms the joint should always be explored, and feels that the condition of the articular cartilage within the circumference of the lesion should determine whether the lesion should be excised. If definitely soft, sodden and rough, although unbroken it is better excised.

Smillie[12] also favours operative treatment and suggests that, in selected cases, healing may follow drilling of the fragment and its bed. He thinks that in early youth the more liberal blood supply of the growing bone, and of the fragment by way of the posterior cruciate ligament, affords the possibility of attaining the ideal result by conservative means.

REPORTS OF CASES

Case 1. A boy aged 16 years complained of intermittent pain in his right knee joint for 2 years. There was no history of any injury to the knee joint. Physical examination revealed some slight atrophy of the quadriceps and tenderness over the medial condyle of the right femur. Roentgenograms showed an area which was interpreted as osteochondritis dissecans of the right medial femoral condyle (Fig. 1).

The right knee joint was explored. The articular cartilage of the femoral condyle was found to be partially fractured, with an unbroken portion still holding the fragment in position. The separation could be easily completed, and after removal of the fragment the crater was bevelled.

On extension of the knee the anterior portion of the medial meniscus appeared to slip into the crater, intefering with joint motion. The impression was gained that the anterior horn of the medial meniscus was hypermobile. It was therefore decided to remove the medial meniscus as well, although at this time the significance of the medial meniscus as a causative agent was not appreciated.

Case 2. A boy aged 17 years complained of pain in both his knee joints, more severe in the left making it impossible for him to participate in rugby and athletics. There was no history of any injury to his knee. Physical examination revealed tenderness over the antero-medial aspect of the left medial femoral condyle and on squatting he experienced pain in the left knee joint.

Roentgenograms revealed lesions of both medial femoral condyles, interpreted as osteochondritis dissecans (Fig. 2A). X-rays of his ankles, hips, elbows and spine showed no lesions that could be interpreted as osteochondritis.

The left knee was explored. The articular surface of the medial femoral condyle was unbroken, but the site of the lesion was clearly indicated by a circumferential groove outlining an area of slight discoloration of the articular cartilage.

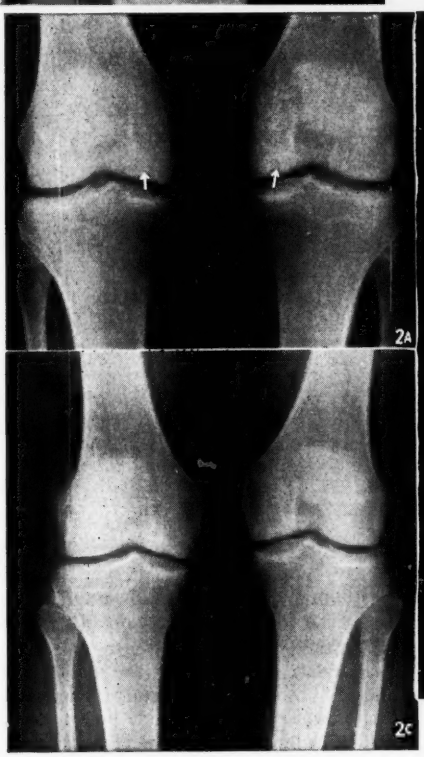
The medial meniscus showed no signs of injury. A hypertrophied fold of synovial membrane and extra-synovial fat lay over the anterior portion of the medial meniscus. Parts of this fold presented pedunculated tags which had the consistency and appearance of fibrocartilage. Between these tags the synovial membrane was congested and oedematous, suggesting impingement against the femoral condyle. On extending the knee joint it was found that the hypertrophied fold impinged on the femoral condyle exactly over the area of the lesion. The anterior horn of the medial meniscus was freely movable, but no actual tear of the anterior attachment was found. Because it was felt that this fold overlying the freely movable anterior horn of the meniscus would repeatedly impinge against the area of the condyle corresponding to the osteochondritic lesion, the meniscus and the hypertrophied fold were removed. As a result of these findings the right knee joint was explored 2 weeks later, and a similar condition was found. The medial meniscus with the hypertrophic tissue is shown in Fig. 2B.

Full weight-bearing was allowed 2 weeks post-operatively. The patient was examined again after 6 weeks and at this time he had no pain and clinically the knees appeared normal. Twelve weeks post-operatively he was seen again and the X-ray appearance of his knees at this time is shown in Fig. 2C. The outline of the lesions was still faintly visible, but there was a marked radiographic improvement of the lesions. At this time he was playing rugby again and felt no discomfort whatsoever.

Case 3. A boy aged 14 years complained of pain in his right knee joint. This troubled him to such an extent that he had to give up all forms of sport. Again there was no history of injury to the joint. Examination revealed a grating sensation over the anterior aspect of the medial joint space on circumduction of the knee. X-rays revealed a lesion of the right femoral condyle interpreted as osteochondritis dissecans (Fig. 3A). X-rays of his ankles, hips, elbows and spine showed no lesions.

The right knee joint was explored. The medial meniscus is shown in Fig. 3B. It is intact but overlaid by a large tag of hypertrophic synovial tissue. This tissue resembles exactly that described in Case 2. For the same reason as in Case 2 it was decided to remove the meniscus and the hypertrophied tissue.

Fig. 1. Osteochondritis dissecans of the femoral condyle (arrow). Note the absence of a prominent tibial spine.



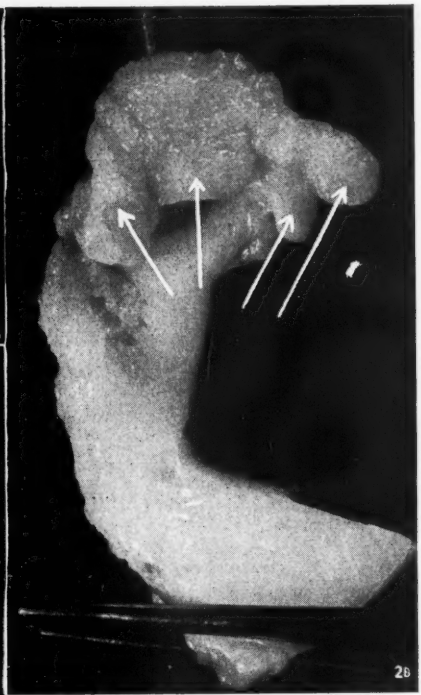


Fig. 2A. Bilateral osteochondritic lesions (arrows). Note the absence of a prominent tibial spine.

Fig. 2B. Meniscus not torn but anterior horn submerged beneath tag of hypertrophic synovia. Hypertrophic tags (arrows) pulled back by forceps.
Fig. 2C. Twelve weeks after operation.

Full weight-bearing was allowed 2 weeks post-operatively, and the patient was examined again after 2 months. At this time he was playing rugby and, on radiographic examination, no sign of the lesion could be detected. (Fig. 3C). After 6 months he was seen again and on clinical and radiological examination the knee joint appeared normal.

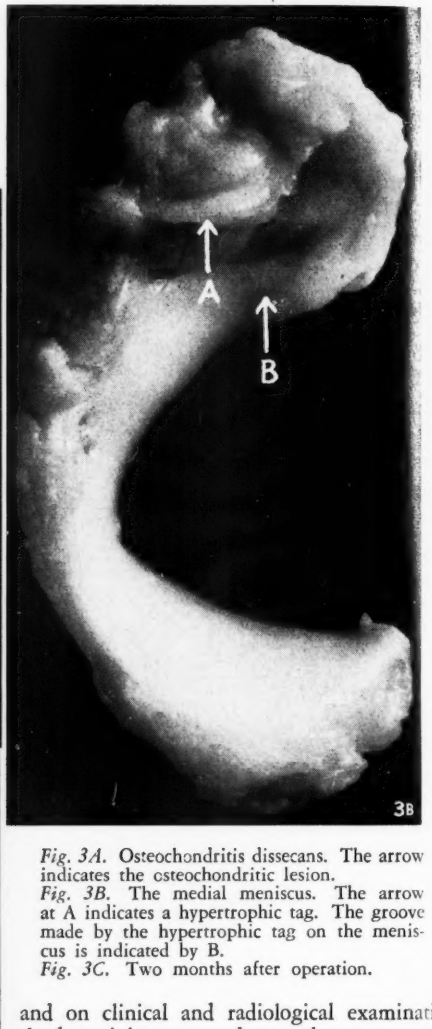


Fig. 3A. Osteochondritis dissecans. The arrow indicates the osteochondritic lesion.
Fig. 3B. The medial meniscus. The arrow at A indicates a hypertrophic tag. The groove made by the hypertrophic tag on the meniscus is indicated by B.
Fig. 3C. Two months after operation.

DISCUSSION

In considering the etiology of osteochondritis dissecans of the knee joint, the frequency of bilateral lesions has been advanced as evidence in favour of some factor other than trauma being present.

Fairbank and Smillie, on the other hand, regard the bilateral frequency as indicating an anatomical peculiarity which predisposes to the trauma which in turn produces the lesion at the typical site. Admittedly most of the traumatic theories explain the occurrence of the

lesion at the typical site. The atypical lesions are, however, less easily explained, and Smillie's attempts at explanation are sound and reasonable.

The cases described here display absence of a prominent tibial spine and of a meniscal injury in the form of a tear, and it seems reasonable to assume that the foregoing findings constitute an anatomical peculiarity resulting in trauma to the medial femoral condyle.

It is not certain whether the abnormal mobility of the anterior horn of the medial meniscus causes the synovial membrane to be nipped between the condyle and the meniscus, but the findings in these joints suggest that this may be the case. Once the hypertrophied tissue and pedunculated tags are present, however, repeated damage occurs to the medial femoral condyle causing the osteochondritic lesion.

Treatment by means of immobilization only appears to be effective when there is non-separation of the necrotic area. This appears to be due to the fact that at 30 degrees flexion no pressure occurs on the pathological area. It is submitted, however, that the hypertrophic tags found in these 3 knees will persist in spite of prolonged immobilization, and that they constitute a potential cause of recurrence of the osteochondritic lesion. It follows therefore that an exploratory arthrotomy is a justifiable procedure in cases of osteochondritis dissecans of the knee joint where separation of the fragment has not occurred. The existence of an anatomical peculiarity as a causal factor can by this means be determined and at the same time removed, prolonged immobilization may be avoided, and recurrence of the lesion be effectively prevented. If no anatomical abnormality is found, multiple drilling of the fragment may be done, should the surgeon favour this procedure.

SUMMARY

The various theories of the etiology and the advocated methods of treatment of osteochondritis dissecans of the medial femoral condyle are discussed.

Case reports are given in which an anatomical peculiarity causing trauma to the medial femoral condyle is considered as a causative factor.

The effect of this abnormality on treatment is discussed.

Healing of the lesions of 3 joints in the cases reported occurred in an abnormally short period, although full weight-bearing was allowed very soon post-operatively.

This is a very preliminary report and is intended to draw the attention to a possible anatomical abnormality which may be a causal factor in some cases of osteochondritis dissecans of the medial femoral condyle of the knee.

OPSOMMING

Die verskillende teorieë omtrent die etiologie, en die voorgestelde metodes van behandeling van osteochondritis dissecans van die dybeenbinnekneukel word bespreek.

In die bespreking van die gevalle word daarop gewys dat 'n anatomiese afwyking wat die dybeenbinnekneukel beskadig waarskynlik die toestand veroorsaak. Die belang van die afwyking in die behandeling van die toestand word bespreek.

Die letsels in 3 gewrigte het in 'n buitengewone kort tydperk genees, nieteenstande die pasiënte kort na die operasie toegelaat is om volle gewig op hul knieë te neem.

Die doel van die artikel is om die aandag te vestig op 'n anatomiese afwyking wat waarskynlik die oorsaak is van osteochondritis dissecans van die dybeenbinnekneukel in sommige gevalle, en moet as sulks beskou word.

REFERENCES

1. Balensweig, I. (1925): J. Bone Jt. Surg., **7**, 465.
2. Bernstein, M. A. (1925): J. Bone Jt. Surg., **7**, 319.
3. Edelstein, J. M. (1954): J. Bone Jt. Surg., **36**-B, 343.
4. Fairbank, H. A. T. (1933): Brit. J. Surg., **21**, 67.
5. Gardiner, T. B. (1955): J. Bone Jt. Surg., **37**-B, 141.
6. Glissan, D. J. (1955): J. Bone Jt. Surg., **37**-B, 354.
7. Green, W. T. and Banks, H. H. (1953): J. Bone Jt. Surg., **35**-A, 26.
8. Hellström, J. (1922): Acta Chirur. Scandinav., **55**, 190.
9. Ludloff, J. (1908): Zentralbl. Chir., **35**, 161.
10. Pick, M. Pickering (1955): J. Bone Jt. Surg., **37**-B, 141.
11. Richards, G. E. (1928): Amer. J. Roentgenol., **19**, 278.
12. Smillie, I. S. (1951): *Injuries of the Knee Joint*, p. 298. Edinburgh: E. & S. Livingstone, Ltd.
13. van Demark, R. E. (1952): J. Bone Jt. Surg., **34**-A, 143.
14. Wagoner, G. and Cohn, B. N. E. (1931): Arch. Surg., **23**, 1.
15. Watson-Jones, R. (1943): *Fractures and Joint Injuries*, p. 107. Edinburgh: E. & S. Livingstone, Ltd.
16. Wollbach, S. B. and Allison, N. (1928): Arch. Surg., **16**, 1177.

SKELETAL CHANGES IN ENDOCRINE AND METABOLIC DISORDERS

XV. OSTEOPOROSIS CONNECTED WITH DIMINUTION OF SEX HORMONE ACTIVITY

SENILE, POST-MENOPAUSAL, Etc.

W. P. U. JACKSON, M.D., M.R.C.P., D.C.H.
Endocrine Clinic, Department of Medicine, Groote Schuur Hospital and University of Cape Town

This is a very common disorder indeed (Fig. 1). In fact, it is probable that every old man and post-menopausal woman loses bone substance to a considerable extent as part of the aging process. Quite often the loss is excessive, leading to vertebral collapse and backache. A small injury, insignificant in a person with healthy bones, a slip over a carpet or something similar, leads to fracture of the neck of the femur. The bone, being porotic, heals badly.

Although this type of osteoporosis is a generalized disorder, the brunt of the affliction falls on the spine and other proximal bones (pelvis, upper ends of femora, ribs). Since the basic process concerned is an atrophy, with lack of new formation of the proteinous bony matrix, no biochemical changes are found in the blood. During the actual period of development of the porosis there is an excessive loss of calcium in the urine, but frequently, by the

Fig. 1. The typical appearance of an osteoporotic patient with loss of height, kyphosis, redundant skin fold across the trunk and reduced forward bending.
Fig. 2. The spine of an elderly man, showing various irregularities of vertebral bodies. Note partial collapse of the upper vertebral bodies, infractions into the vertebral plate (arrow at A) and ballooning of the lower disc causing a concavity in body (arrow at B). The osteophytes at the anterior margins are secondary to vertebral damage.

time the condition has progressed to the production of symptoms, the urinary calcium is no longer abnormally raised. This brings out the point that the advance of osteoporosis is slow. Loss of bone substance may have been occurring for 10 years or more before becoming clinically apparent.

The sex hormones (androgens and oestrogens) are both concerned with the proper maintenance of bone matrix, and when their activity wanes, osteoporosis may develop. The following states, therefore, are concerned:

i. Old age in men.
ii. The post-menopause in women, whether natural or *artificial*.
ii. Paraplegia, with testicular atrophy.
v. Eunuchoidism.
v. Hypopituitarism.
vi. Ovarian agenesis.

In the last 3 states the porosis is not usually gross. However, two patients over 40 whom we have seen with ovarian agenesis (gonadal dysgenesis) both suffered from collapsed vertebrae and one presented with a fractured neck of femur.

A further important aetiological agent in the production of osteoporosis is *disuse*. Simple recumbency in bed in old people, and in the plaster jacket or cast in the young, is particularly dangerous in this respect. The loss of bone substance in young people may be so fast that calcium-containing renal calculi may be produced from the excessive amount of this mineral passing through the kidneys.

RADIOLOGICAL APPEARANCES (FIGS. 2–5)

The *vertebral bodies* lose bone substance, leading first to a greater prominence of major trabeculae and later to a body so pale that no structure can be made out at all. The cortex is thinned and stands out as a thin, 'pencilled-in' line around the body. Nevertheless, it is extremely difficult to be sure of porosis unless there is also change in vertebral shape, because differences is thickness of soft tissue and in technique can be so great that porosis may appear to be present when it is not. The features secondary to the loss of bone substance are best seen in lateral films:

1. Multiple compression collapse of vertebral bodies, with variable degrees of anterior wedging.
2. Expansion of the disc space into the adjacent body, either throughout the whole surface (producing a semilunar depression) or locally (appearing as a Schmorl's node).
3. Multiple small fractures or infractions through the vertebral plate, showing as breaches in the contour of the superior or inferior surfaces of the bodies concerned.
4. A particularly characteristic feature is the irregular disposition of the vertebral damage, as opposed to the uniformly compressed appearance of the bodies which is more usually seen in osteomalacia, osteitis fibrosa of hyperparathyroidism and osteogenesis imperfecta.

On the other hand it may well be mimicked by myelomatosis and secondary carcinomatosis.

The pelvis, ribs and sternum may show evidence of loss of density while pathological fractures of the ribs, neck of femur and, occasionally, neck of humerus may occur.

DIAGNOSIS

Osteoporosis is probably the commonest cause of backache in older people. It is far more important than osteoarthritis of the spine, which is not easy to diagnose and which, in any event, is a process secondary to a basic lesion, either disc or vertebral injury. The osteophytes so frequently seen projecting from the anterior aspect of vertebral bodies are also usually secondary to underlying structural change and, of themselves, are of no significance. They cannot indicate an arthritis, since they are not in connexion with any synovial joint.

A very severe degree of osteoporotic collapse should make one suspect a second contributory cause, such as thyrotoxicosis or myelomatosis.

TREATMENT

The use of sex hormones is often most gratifying. A mixture of stilboestrol (1 mg.) with sublingual methyl testosterone (10 mg.) daily may easily be continued indefinitely. The latter is expensive, however, and stilboestrol alone is often equally effective, but it must either be used in doses which do not cause bleeding or, if the patient is only recently past the menopause, it may be given cyclically. If the stilboestrol causes nausea and vomiting, one can either continue in the (usually justified) belief that these toxic effects are only temporary, reduce the dose, or change to another oestrogen such as ethinyl oestradiol or Premarin. I see no advantage in ready-made hormone mixtures, which are less flexible; neither is there any proven advantage in the so-called non-masculinizing androgens (e.g. methyl androstenediol). In women, the testosterone used must be kept below the dose at which unpleasant virilizing effects appear or at which sexual stimulation is produced. In men, testosterone alone should be used.

There is absolutely no indication for increasing the calcium intake, giving vitamin D, etc.

The diet should be normal and balanced, with good protein intake.

Mechanical support to the spine is useful where pain and instability persists, but should be worn as little as is consistent with relief of pain. A surgical corset is usually more comfortable than the more rigid brace. (For a detailed recent discussion of this subject the reader is referred to Moldawer[4]).

OPSOMMING

Idiopatiese osteoporose is 'n toestand van algemene verdunning van been (veral die ruggraat), oënskynlik

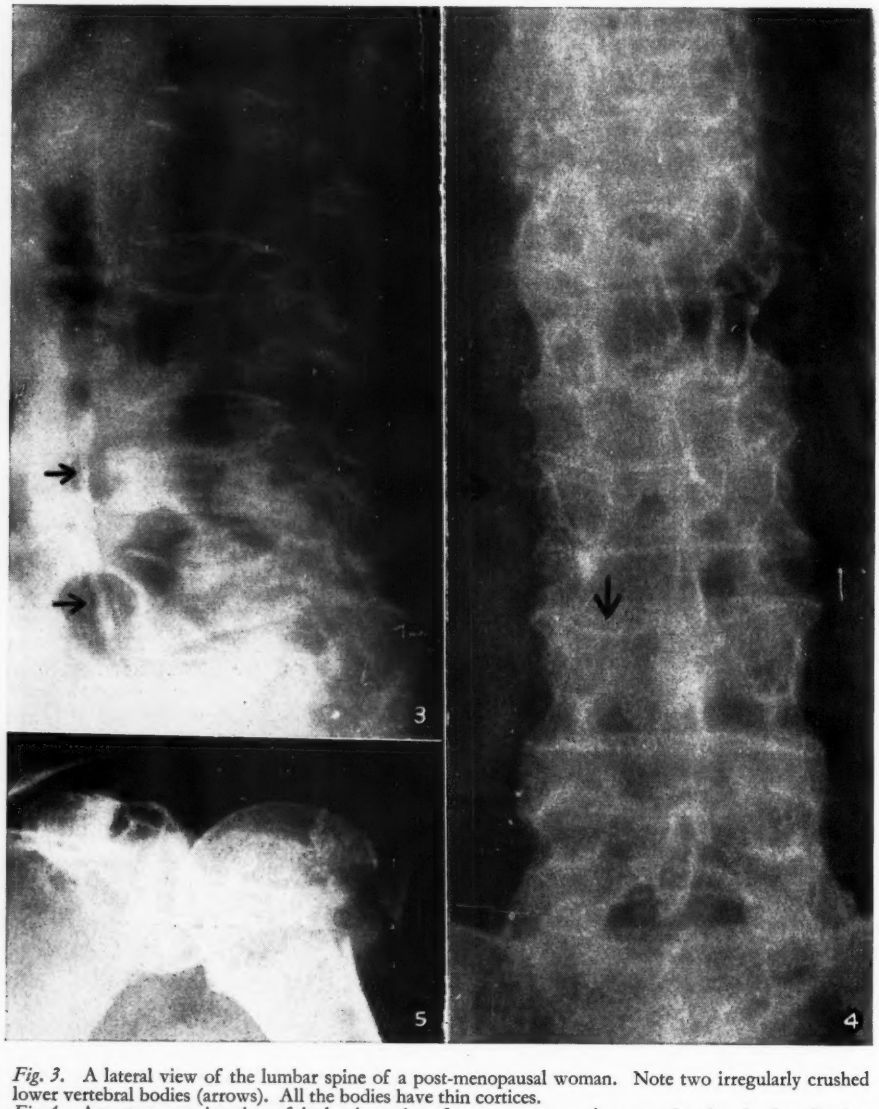


Fig. 3. A lateral view of the lumbar spine of a post-menopausal woman. Note two irregularly crushed lower vertebral bodies (arrows). All the bodies have thin cortices.
Fig. 4. A postero-anterior view of the lumbar spine of a post-menopausal woman showing demineralization and multiple irregularities in outline. The arrows indicate a partially crushed body and a damaged superior vertebral plate.
Fig. 5. A pathological fracture through the porotic neck of the humerus in the same woman. This is very uncommon. The porotic neck of femur fracture is, of course, common.

ver orsaak deur 'n tekort in die matrysformasie. Dit kor voor op jeugdiger leeftyd as gewoonlik, en in sod nige omstandighede dat geen bekende faktor gei krimineer kan word nie.

I ie differensiële diagnose is van die allergrootste bel ng en hang grotendeels af van die uitsluiting var toestande soos miëlomatose, tirotoksikose en anl lose-werwelontsteking.

ehandeling is besonder onbevredigend.

REFERENCES

1. Albright, F. and Reifenstein, E. C. (1948): *The Parathyroid Glands and Metabolic Bone Disease.* Baltimore: Williams & Wilkins Co.
2. Cooke, A. M. (1955): Lancet, **1**, 877, 929.
3. Jackson, W. P. U. (1955): S. Afr. Med. J., **29**, 885.
4. Moldawer, M. (1955): Arch. Int. Med., **96**, 202.

PRIMARY PULMONARY HAEMOSIDEROSIS

M. M. POSEL, M.D. (LOND.), M.R.C.P. (LOND.)*

and

JOSSE KAYE, M.R.C.S. (ENG.), L.R.C.P. (LOND.), D.M.R.†

Johannesburg General Hospital, Johannesburg

Brown induration of the lung is known to occur in cases of mitral stenosis, and gives rise to a well-known set of symptoms and signs.

Less widely known, however, is a similar pathological condition, occurring as a rule in young people, and not associated with any cardiac disease. To this condition, first described by Ceelen, the name of primary pulmonary haemosiderosis has been given.

Hitherto mainly described in children, it is seldom recorded in adult life, and no case that we have been able to trace shows a follow-up (such as in the present case) from childhood to the age of 29 years. The case here recorded was observed for many years in a county chest clinic in England.

Miss U. G. M., aged 29, a children's nurse, arrived in Johannesburg from England some 2 years before her last (and fatal) illness.

From the age of 11 years she had been under treatment for paranasal sinusitis and bronchitis, and for this history we are obliged to Dr. Robert Ellis, of Cottenham, Cambridgeshire, who writes:

'She first came under my care as a child aged 11 in 1938. She then had septic antra, especially on the right side, and the history dated from the age of 7.

I have enclosed all the notes and X-ray films that were taken by Dr. Paton Philip, the chest physician at Cambridge, over the 15 years I had her under observation. You will note that she fluctuated—sometimes improving and at other times deteriorating.

From time to time she had various other infective complications, such as iritis, which the ophthalmic surgeon attributed to the sinus infection; also a cellulitis of the left leg when she was about 15, which was so acute that it was explored by Mr Bourn, the senior surgeon at Addenbrook Hospital, Cambridge, suspecting osteomyelitis of the tibia. This was not found, however, but the leg never regained its normal size.

I think it is fair to assume that all her complications originated from the septic focus of the antra.

She had a Caldwell-Luc operation on the left antrum.

You will observe that, from the very beginning, the chest physicians considered her to have bronchiectasis.'

She remained well for the first 2 years in South Africa and, in February 1956, she was admitted to the General Hospital, Johannesburg, under the care of one of us (M. M. P.), with a history of a moderately severe haemoptysis, and some breathlessness on effort.

She had a mild chest infection some weeks before, which had been treated by her family doctor.

Examination at this stage revealed a well nourished female, not dyspnoeic, but with a very distressing cough.

She was pyrexial, and had slight clubbing of the fingers.

The heart showed no abnormal rhythm, and there was nothing abnormal on auscultation.

The lungs were filled with moist, coarse and medium rales, and, as a confident diagnosis of bronchiectasis had been made in England, this was accepted together with a super-added infection.

A blood examination done at this stage showed Hb, 7.5 g. %, with a white cell count of 13,500 per c.mm. (85% neurophils).

The E.S.R. was 25 mm. in one hour.

Platelets, and bleeding and clotting times were normal.

Therapy (injections of penicillin and streptomycin) was started, and a blood transfusion of 1 litre of fresh blood was given. The Hb rose to 10 g. %.

* Physician Specialist.
† Chief Radiologist, Johannesburg General Hospital, Johannesburg.

Some 2 days after admission she started copious vomiting of a coffee ground material. There was a precipitate fall in blood pressure, and the patient became comatose. The leucocyte count rose to 27,000 per c.mm., and the blood urea was found to be 140 mg. per 100 c.c.

Therapy consisted of various antibiotics and blood transfusion, but the renal condition deteriorated, and the patient remained comatose.

A lumbar puncture revealed nothing abnormal.

Coffee-ground vomiting continued, and the blood urea rose to 440 mg. per 100 c.c., but the specific gravity of the urine remained 1020, with a moderate output.

At this stage a large bowel wash-out was given, with a copious evacuation of solid black material, and the blood urea fell to 200 mg. per 100 c.c.

After this the patient became mildly jaundiced with urobilin in the urine and no bilirubin.

The red cell fragility was normal, and the Coomb's test negative.

The coma persisted, the blood urea rose and, in spite of a multitude of therapeutic measures, she died some 2 weeks after admission.

The ante-mortem diagnosis was bronchiectasis and uraemia.

Post Mortem Report (Dr. Chatgidakis, of the Pathological Department of the Johannesburg General Hospital) is as follows:

1. Primary pulmonary haemosiderosis (Ceelen's disease) with massive haemorrhages into the lungs terminally. No evidence of bronchietasis was found.
2. Suppurative pyelonephritis with a haemorrhagic cystitis, probably associated with repeated catheterization.
3. Renal failure.

Histology. Sections of the lungs show the histological features of masses of siderophages with focal ferrugination and degeneration of the elastic tissue of the alveolar walls. In addition, there is a perivascular, non-granular cell infiltrate, with recent wide-spread intra-alveolar haemorrhages.

Sections of the kidneys confirm the diagnosis of an acute wide-spread suppurative nephritis with sulphonamide crystals in the tubules.

Sections of the myocardium show the histological features of early pyaemic abscesses.

Sections of the spleen show the histological features of early pyaemic abscesses.

DISCUSSION

A proven case of primary pulmonary haemosiderosis, with post-mortem findings, is reported. For years a firm diagnosis of bronchiectasis had been made and accepted.

At the last and fatal illness, each bleed into the lung was accompanied by a severe anaemia of the iron-deficiency type, accompanied by much coughing and expectoration. As no thought of pulmonary haemosiderosis was considered, diagnosis by means of iron pigment in a biopsy specimen, obtained by lung puncture, was not attempted.

If pulmonary haemosiderosis had been considered likely in her early illnesses, demonstration of haemosiderin in the sputum, or gastric washings, might have established the diagnosis.

In the final illness no clinical cause for the acute anaemia could be found, and this was undoubtedly due to the blood shed into the respiratory passages. No circulating antibodies were detected. The blood exhibited no evidence of destructive morphology (except that of iron deficiency) and there was active regeneration. Platelets, bleeding and clotting time were normal.

No evidence of either haemorrhage or haemosiderin deposition were found outside the lung.

One can, therefore, say that bleeding into the lung is the simple explanation, but the difficulty of explaining the occurrence of the bleeding remains, and no reason can be given except the very vague one of a disorder of the pulmonary circulation—of which we have no evidence in this case.

A hereditary defect of the elastic tissues of the walls of the small blood vessels and alveoli may be the cause. The defect may be slight to begin with, but may become more apparent with each successive bleed.

The clinical course is episodic and, in this case, was mistaken for bouts of infection in bronchiectasis.

The radiological picture is interesting, but non-confirmatory of the diagnosis. A separate radiological report on the case is furnished.

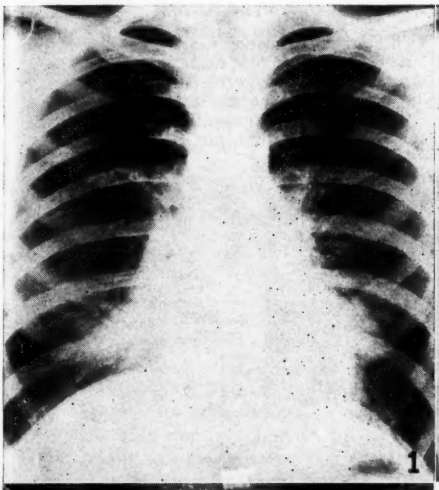
One method of diagnosis is the demonstration of macrophages containing haemosiderin in the sputum or in material obtained by lumbar puncture, but only in the definite absence of an organic defect in the heart such as mitral stenosis.

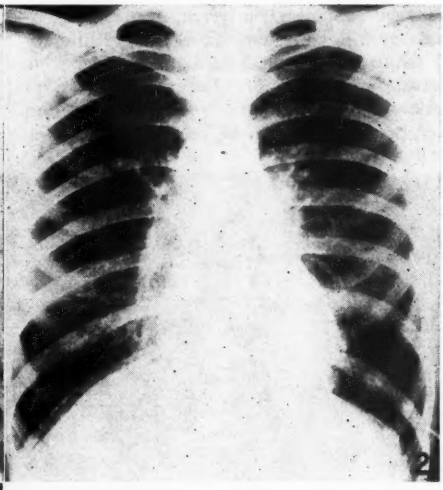
It is interesting to conjecture how many cases of this condition are diagnosed as bronchiectasis with haemoptysis. Two cases have recently been described in which both conditions were present (proved at autopsy), but here bronchiectasis was definitely excluded in the post-mortem examination.

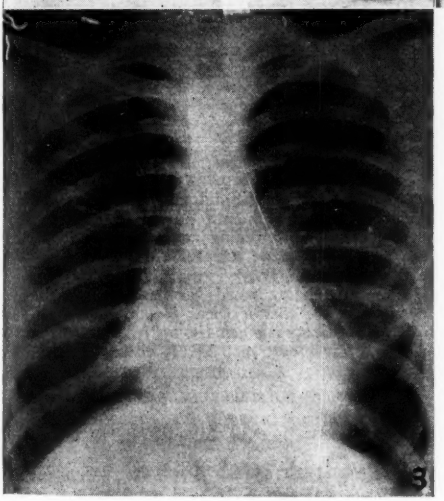
The diagnosis of idiopathic pulmonary haemosiderosis should be considered in persons

with unexplained diffuse pulmonary infiltration and anaemia.

Treatment is usually confined to repairing the anaemia by blood transfusion and, in a few recently reported cases, temporary improvement has followed therapy with ACTH and cortisone.







RADIOLOGICAL FEATURES

These are interesting in that the radiological changes can be followed from 1940 until 1956.

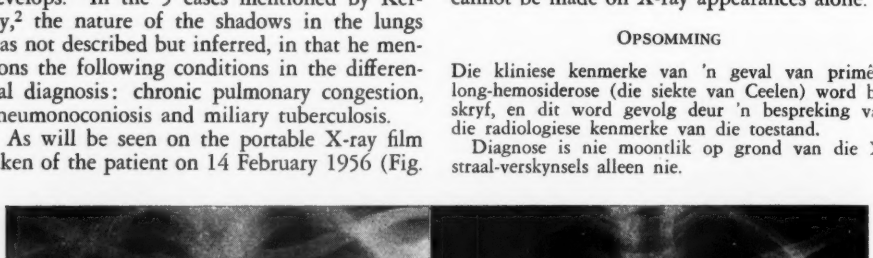
On the initial X-Ray (taken 1 May 1940, Fig. 1), there was an ill-defined area of consolidation in the region of the right cardiophrenic angle, and a second pneumonitic area immediately above the apex of the heart. In the absence of lateral radiographs, the shape and distribution of the shadows suggest that the changes affected the middle basal segment on the right side, and the inferior segment of the lingula on the left side. In view of the changes described, the original diagnosis of bronchiectasis appears to be justified. On the second X-ray (7 July 1941, Fig. 2), the patchy areas of consolidation appear to have cleared completely. They are seen to recur, however, in exactly the same distribution on 14 December 1942 (Fig. 3). Bronchograms done after 1942 showed no evidence of bronchiectatic change.

The changes seen on these radiographs are different from those described by Hodson *et al.*[1] and by Kerley,[2] in Ceelen's disease. Hodson *et al.* describe two main patterns, acute and chronic. In the acute pattern, multiple blotchy shadows are scattered irregularly throughout both lung fields and vary in size from a few mm. 2–3 cm. in diameter. There may be a few such lesions or there may be very many. Their distribution typically changes over short periods, each lesion lasting only a few days. This changing pattern tends to be more marked during the acute episode. In the chronic phase a reticulation, affecting mainly the middle and lower lobes, becomes evident. This becomes denser as the disease progresses and may obscure the normal vascular pattern. These two patterns may be superimposed.

Kerley[2] does not analyse the appearance of the shadows in any detail, other than to mention that small opacities 1–3 mm. in size, ex-

tending from the apex to the base and giving rise to a classical miliary appearance, may be present. He mentions that a reticulated pattern may appear when pulmonary fibrosis occurs and the cardiac and diaphragmatic outlines may become hazy when pleural fibrosis develops. In the 5 cases mentioned by Kerley,[2] the nature of the shadows in the lungs was not described but inferred, in that he mentions the following conditions in the differential diagnosis: chronic pulmonary congestion, pneumonoconiosis and miliary tuberculosis.

As will be seen on the portable X-ray film taken of the patient on 14 February 1956 (Fig. 4), there are blotchy, ill-defined opacities (many of which have become confluent) in both lung fields. They are denser towards the bases and more extensive in the right lung field. On the radiograph taken 9 days later (Fig. 5), there has been considerable resolution and clearing of the upper portions of the lung fields, this pattern and change being similar to the one described by Hodson *et al.*[1]



In the absence of a detailed history, the following differential diagnosis was submitted:

(*a*) Broncho-pneumonia;
(*b*) Chronic pulmonary congestion;
(*c*) Primary atypical pneumonia;
(*d*) Pyaemic abscesses;
(*e*) Afungal lesion.

In reviewing the X-ray findings presented in this case, and comparing them with the findings described by Hodson *et al.*[1] and Kerley,[2] the following facts become evident:

(*a*) In the original X-rays, the blotchy changes described by Hodson *et al.*[1] were not seen.

(*b*) The re-appearance of shadows identical with those first seen, and after the lungs had cleared, appears unusual.

(*c*) In spite of the long history, no reticular pattern suggesting fibrosis and a chronic history could be detected.

(*d*) The diagnosis of primary haemosiderosis cannot be made on X-ray appearances alone.

OPSOMMING

Die kliniese kenmerke van 'n geval van primêre long-hemosiderose (die siekte van Ceelen) word beskryf, en dit word gevolg deur 'n bespreking van die radiologiese kenmerke van die toestand.

Diagnose is nie moontlik op grond van die X-straal-verskynsels alleen nie.

Bronciektasie met hemoptise kan moeilikheid oplewer vir sover dit die differensiële diagnose betref.

Die moontlikheid van idiopatiese longhemosiderose moet in oorweging geneem word by pasiënte wat aan onverklaarde verspreide pulmonale infiltrasie en bloedarmoede ly.

Die behandeling word gewoonlik beperk tot die herstel van die anemie (deur bloedoortapping). Daar is onlangs aanspraak gemaak op tydelike verbetering volgende op terapie met ACTH en kortisoon.

REFERENCES

1. Hodson, C. J. *et al.* (1953): J. Fac. Radiol., **5**, 50.
2. Kerley, D. (1951): *Textbook of X-ray Diagnosis,* 2nd ed., **2**, 181. London: H. K. Lewis.

ADDITIONAL REFERENCES

Jonsson, B., Vahiquist, V. and Agner, K. (1951): Blood, **6**, 665.
Wiesmann, W., Wolvius, D. and Verloop, M. C. (1953): Acta Med. Scand., **146**, 341.
Steiner, B. (1954): Arch. Dis. Childh., **29**, 391.
Fleischner, F. G. and Berenberg, A. L. (1954): Radiol., **62**, 522.
Wigod, M. (1955): New Eng. J. Med., **253**, 413.

ANNOTATION

RISTOCETIN*

FROM CHICAGO TO KOKSTAD

The recent lay publicity accorded a new antibiotic, ristocetin, (which was flown to South Africa at the beginning of December 1957, for the treatment of the pulmonary complications of fibrocystic disease of the pancreas) has stimulated interest in the nature and properties of this drug, the discovery of which was announced only in the preceding month. It was isolated from a new species of actinomycetes (*Nocardia lurida*) found in random soil samples collected by an Abbott research worker while on a vacation visit to the Garden of the Gods in Colorado.

Supplies of the antibiotic are not generally available and the manufacturers have decided to release the drug, in the first instance, to hospitals, particularly as it is suitably administered only by intravenous injection, preferably by the drip technique. The required dosage is dissolved in 5% dextrose in water and administered in 35 to 40 minutes. The time of administration is important, as otherwise a peak concentration may not be attained. It appears that the maximum concentration for intravenous administration is 1.25% and maximum rate of administration is 2 c.c. per minute at this concentration.

The drug must not be given by intramuscular injection (because of the local irritation produced) and it is ineffective by month.

Clinical studies over the past 3 years have indicated its scope. Ristocetin is effective against a wide range of staphylococcal, streptococcal and pneumococcal infections. An interesting property is the fact that it is bactericidal in about the same concentrations at which it is bacteriostatic. It is also claimed that resistance to ristocetin does not develop easily or to the same degree as to other antibiotics.

It has been established that although, in certain cases, *in vitro* studies may show a relative insensitivity on the part of the pathogenic organisms to ristocetin, satisfactory clinical responses nevertheless occur *in vivo*. This phenomenon has, of course, also been experienced with other well-known antibiotics.

Organisms which have become resistant to other antibiotics have responded with marked sensitivity to ristocetin. There is not, however, evidence at present to support its use in human mycobacterial infections, but it can be resorted to for infections of the nervous system when the responsible organisms are accessible to the antibiotic in the circulating blood. Ristocetin does not penetrate the meninges to any extent in normal circumstances.

CLINICAL STUDIES

Romansky, Limson and Hawkins[1] reported on laboratory and clinical studies with ristocetin. Six cases of pneumococcal pneumonia were described in which rapid defervescence followed the administration of the antibiotic; 3 additional cases of nonspecific pneumonia or bronchitis also responded excellently. In this same series there were 2 cases of bacteraemia and bacterial endocarditis due to microaerophilic enterococci. Previous treatment of these patients had included large dosages of penicillin, streptomycin, chloramphenicol, tetracycline and novobiocin. Dosage of ristocetin ranged from 250 mg. every 4 hours to 1 g. every 6 hours. Following clinical response and negative blood cultures, the administration of 500 mg. every 12 hours was continued for 7 to 10 days. No relapses were observed.

Subsequently Romansky *et al.*[2] described the successful short-term treatment of 9 cases of endocarditis due to enterococcal, staphylococcal and alpha haemolytic streptococcal organisms. In several instances there was a dramatic response after repeated failure with other antibiotics used in large amounts.

Encouraging clinical results have also been reported by at least 15 other investigators for a variety of conditions which included endocarditis, lung, brain and subhepatic abscess, chronic staphylococcal urinary tract infection, cellulitis of the face, osteomyelitis, staphylococcal pneumonia and staphylococcal bacteraemia.

SIDE EFFECTS

A number of side effects has been reported. These have, however, not been sufficiently

*Marketed by Abbott Laboratories under the name of *Spontin*.

serious to outweigh the value of the antibiotic, especially in cases of grave emergency. A few allergic reactions have been recorded. These have generally taken the form of a skin rash, either local at the site of the infusion or, more commonly, a generalized eruption. No anaphylaxis has been reported.

Diarrhoea has occurred in an occasional patient on high dosage.

Thrombophlebitis has occasionally been reported in the veins proximal to the site of administration, but is less likely to occur if the recommended method of administration is followed. Local irritation (which has not proceeded to necrosis or abscess formation) has been reported following displacement of the infusion needle.

In a small number of cases, a drug fever has occurred after ristocetin has been administered for several days. In some cases this has been accompanied by a skin eruption. On withdrawing therapy, both the fever and the skin eruption subsided promptly.

Of 80 cases which have been thoroughly studied during the administration of ristocetin, 6 have developed a significant depression of the white cell count with relative neutropenia. In one of these patients the dosage was extremely high (9 g. per day) and 2 cases had received other medication reported to have an association with depression of the white cell count in a proportion of patients. In the 3 remaining cases it seemed that ristocetin itself might have been responsible.

Bone marrow examinations were carried out in 2 of the 6 cases—in one case at the time of the neutropenia; in the other, about 2 weeks later. There were no abnormal findings.

All cases of neutropenia returned to normal within 2 weeks of cessation of therapy, and all cases made a good recovery from the initial illness. One investigator has advanced the theory that the neutropenia may be a peripheral effect, and not associated with depression of the bone marrow.

THE PRESENT POSITION

The manufacturers are not in a position to release supplies, for the time being, except for cases of genuine emergency.

It is, of course, as yet very early to assess the ultimate place of ristocetin in our antibiotic armamentarium. Its role in the treatment of infections resistant to other drugs seems clearly established. Further reports about its actions and properties will be awaited with very great interest; but its discovery will certainly be recognized as a striking tribute to the pertinacity, vigour and ingenuity with which the search for additional therapeutic weapons is being pursued.

OPSOMMING

Teen die einde van 1957 is 'n nuwe antibioticum (ristocetin) deur Abbott Laboratories Ltd. aangekondig.

Dit is aktief teen 'n aansienlike verskeidenheid van organismes, en is skynbaar veral doeltreffend vir die behandeling van infeksies wat weerstand teen ander antibiotica bied.

Die middel kan slegs binne-aars toegedien word.

Die newe-effekte daarvan word beskryf.

Die fabrikante is voorlopig nie in staat om voorrade beskikbaar te stel behalwe vir die allerernstigste noodgevalle nie.

1. Romansky, M. J., Limson, B. M. and Hawkins, J. E. (1956-57): *Antibiotics Annual*, p. 706.
2. Romansky, M. J. and Holmes, R. (1957): Clin. Research Proc., **5**, 200.

NOTES AND NEWS

Mr. G. C. F. van Helsdingen, M.B., B.Ch., Dip. Surg. (Univ. W.W.Rand), has commenced practice as a General Surgeon at 81 Jenner Chambers, Jeppe Street, Johannesburg, and at 105 Medical Centre, Voortrekker Street, Germiston. (*Telephones*: Johannesburg, *Rooms*: 22-3847; Germiston, *Rooms*: 51-8775; *Residence*: 58-4630).

• • •

Dr. L. H. Muller, formerly of the Pretoria Orthopaedic Centre (University of Pretoria and the Pretoria General Hospital) has commenced practice as a specialist orthopaedic surgeon in Bloemfontein.

He has joined Dr. T. B. Enslin in partnership at Cuthbert's Buildings, Maitland Street, Bloemfontein.

Dr. L. H. Muller, voorheen op die staf van die Pretoriase Ortopediese Hospitaal, Pretoria, tree in vennootskap met dr. T. B. Enslin as 'n ortopediese chirurg. Adres: Cuthbertsgebou, Maitlandstraat, Bloemfontein.

• • •

Dr. O. S. Treisman, M.B., B.Ch. (Rand), M.R.C.O.G., has commenced practice as a specialist obstetrician and gynaecologist at 1008 Cavendish Chambers, Jeppe Street, Johannesburg. (Telephones: *Rooms*: 22-3216; *Residence*: 44-5755).

• • •

Mr. F. J. Hedden, B.Sc., M.B., B.Ch. (Wales), F.R.C.S. (Eng.), F.R.C.S. (Ed.), has commenced practice as an orthopaedic surgeon at 602 Payne's Building, West Street, Durban. (Telephones: *Rooms*: 20042; *Residence*: 44933).

Dr. P. D. de Villiers, M.B., Ch.B. (Kaap), D.M.R.D. (R.C.P. & S., Eng.), F.F.R. (Lond.), voorheen van King Edward VIII Hospitaal, Durban, het kort gelede van 'n besoek aan Engeland teruggekeer en het by Drs. Samuel, Komins, Denny en Berezowski in konsulterende radiologiese praktyk aangesluit te Lister-gebou 1, Johannesburg.

* * *

Dr. P. D. de Villiers, M.B., Ch.B. (Cape Town), D.M.R.D. (R.C.P. & S., Eng.), F.F.R. (Lond.), previously of King Edward VIII Hospital, Durban, has recently returned from a visit to England, and has joined Drs. Samuel, Komins, Denny and Berezowski in consultant radiological practice at 1, Lister Buildings, Johannesburg, in January.

* * *

Dr. Morris Medalie of 809 Medical Centre, Jeppe Street, Johannesburg, has returned from a short visit to the U.S.A., and has recommenced practice as a specialist in diseases of children.

While in America, he visited a number of children's hospitals in New York and Boston.

* * *

Dr. L. Friedlander, M.B., B.Ch. (Rand), M.R.C.P. (Lond.), D.C.H., R.C.P. & S. (Eng.), has commenced practice as a specialist in diseases of children.

Dr. Friedlander has recently returned from a prolonged period of post-graduate study overseas. He spent 4 years in the United Kingdom, during which time he held appointments at The Hospital for Sick Children, Great Ormond Street, London. In the course of a 2-year stay in the U.S.A., he was a Research Fellow in Pediatrics at Harvard Medical School and the Children's Medical Center, Boston.

Dr. Friedlander's rooms are at 606 Ingram's Corner, Twist Street, Hillbrow, Johannesburg. (Telephones:—*Rooms*: 44-7211; *Residence*: 25-1805).

* * *

Dr. Michael Tonkin, formerly Deputy Superintendent of the Johannesburg General Hospital and, at the time of his resignation, Medical Superintendent of Coronation Hospital, has assumed the post of Medical Director on the staff of Scherag (Proprietary) Limited. He will be stationed in Johannesburg.

Dr. Michael Tonkin

Dr. Tonkin's appointment is unique in that the conditions governing his duties were submitted to and approved of by the South African Medical and Dental Council, as well as by the Southern Transvaal Branch of the Medical Association of South Africa.

Dr. Tonkin is a pioneer in a sphere which inaugurates a new era in the history of medicine in South Africa, which now follows a well established example in the United Kingdom and the U.S.A., where pharmaceutical organizations make use of the professional services of full-time medical practitioners in control of a separate medical division.

Included in Dr. Tonkin's duties will be the planning and the supervision of medical research and individual clinical research projects, in consultation with his colleagues in the medical profession.

Mr. A. Radford

Mr. Aubrey Radford, F.R.C.S., has been successful in obtaining the United Party nomination for the Durban Central seat for the next general election to the House of Assembly.

Mr. Radford is well known to the medical profession as a member of the South African Medical and Dental Council.

* * *

WESTDENE PRODUCTS SCHOLARSHIP

The following awards have been made to 4th, 5th and 6th year medical students at the undermentioned Universities

Each Westdene Products Scholarship is worth £100 and the awards are made to medical students of high academic standards and showing a sense of social responsibility by taking an active part in student affairs.

Witwatersrand University	4th year	R. B. K. Tucker
	5th year	P. V. Weston
	6th year	E. V. La Rocca (Mrs.)
Pretoria University	4th year	J. H. Nell
	5th year	C. J. Pistorius
	6th year	J. M. Opperman
Cape Town University	4th year	D. C. Clain
	5th year	B. M. Kennelly
	6th year	M. S. Gotsman
Natal University	4th year	B. R. Maku
	5th year	I. M. Seedat
	6th year	B. T. Naidoo

* * *

SUPPLY OF REPRINTS

Medical Proceedings reprints from standing type. Revised prices as from 1st November, 1957.

On Supercalender Paper

No. of pages	*No. of copies* 50			100			200		
	£	s.	d.	£	s.	d.	£	s.	d.
2	1	12	6	1	16	9	2	4	5
4	4	9	0	4	13	0	5	1	0
6	6	1	8	6	9	0	7	3	9
8	8	13	7	9	3	4	10	2	9
10	10	7	0	10	18	6	12	1	6
12	13	2	3	13	16	4	15	4	6
16	17	2	6	18	1	6	20	0	3

On Art Paper

2	1	13	8	1	18	0	2	6	8
4	4	10	3	4	15	5	5	5	8
6	6	4	3	6	12	9	7	10	8
8	8	16	8	9	8	5	10	12	0
10	10	9	6	11	4	0	12	12	6
12	13	5	6	14	3	0	15	17	9
16	17	6	9	18	10	6	20	18	0

NUTRITION SOCIETY OF GREAT BRITAIN

The Scottish Group of the Nutrition Society will hold a symposium on *Nutrition and Climatic Stress* at the Hannah Dairy Research Institute, Kirkhill, Ayr, on Saturday, 26 April 1958.

The Nutrition Society will hold its Annual General Meeting in London on Saturday, 31 May 1958.

• • •

NATAL MEDICAL SCHOOL: FIRST GRADUATES

The following students (the first to complete the curriculum at the University of Natal Medical School) have passed the final examinations for the degrees of Bachelor of Medicine and Bachelor of Surgery:

Davidson, C. H.
Foster, N. E. G.
Kallichurum, S. (Miss)
Makunyane, A. M. S.
Mayet, F. G. H. (Miss)
Mogadime, H. M.
Naidoo, B. T.
Naidoo, K. (Miss)
Ngakane, P. S. M.
Pillay, V. K. G.
Thambiran, A. K.
Zondi, M. B.

• • •

PROFESSIONAL PROVIDENT SOCIETY OF SOUTH AFRICA

This Society has achieved, during October 1957, two milestones in its development. Its assets passed the quarter million mark and its membership rose to over one thousand.

There can be no doubt that this Society, run by the professions for their members, is in a very sound position and those who have not yet done so should take advantage of the unequalled benefits it offers.

• • •

TO LET: PROFESSIONAL CENTRE, OBERHOLZER

Professional suites are in the course of completion. Occupation for 1 February 1958. Suitable for Doctors, Dentists, etc.

This beautifully designed building is in a most prominent position adjoining the leading Gold Mines of the Far West Rand.

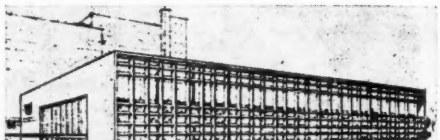
Apply to: Messrs. Dowling and Schultz, P.O. Box 6, Oberholzer. *Telephone* (Dial 900) 1459 Carletonville; *After Hours* (Dial 900) 1557 Carletonville.

• • •

PROPOSED INSTITUTE FOR PARASITOLOGY, DURBAN

Plans are now well advanced for the erection of an Institute for Parasitology in Durban, south of the Durban Medical School (which is shown in the background in the accompanying illustration).

This project has grown out of the work initiated by the Amoebiasis Research Unit of the C.S.I.R., under the direction of Dr. Ronald Elsdon-Dew.



Amongst the sponsors whose contributions have made possible the first steps in the construction of the Institute for Parasitology are:

Lederle Laboratories Division, American Cyanamid Company;
Natal University Development Fund;
Pfizer Laboratories S.A. (Pty) Limited;
South African Sugar Association.

PREPARATE EN TOESTELLE

STECLIN–V

SQUIBB SE TETRASIKLIENFOSFAAT-KOMPLEKS

Steclin–V is die nuwe fosfaat-kompleks van tetrasiklien wat vinniger en hoër aanvanklike bloedpeile bewerkstellig vir vinnige, en ten volle doeltreffende breëspektrum-antibioticum-terapie wat goed deur die pasiënt verdra word. Iedere *Steclin–V*-kapsule bevat tetrasiklienfosfaat-kompleks gelykstaande aan 250 mg. tetrasiklienhidrochloried.

Effek: *Steclin–V* het 'n opvallende mirkobebestrydende effek op 'n groot verskeidenheid van patogeniese organismes, insluitende Gram-positiewe en Gram-negatiewe bakterieë, spirochete, sekere groot virusse, sekere rickettsias en *Endamoeba histolytica.*

Voordele: Vinniger en hoër aanvanklike antibiotiese bloedpeile word deur *Steclin–V* geproduseer as wat met die ouer vorms van tetrasiklien bewerkstellig kan word. Dit word maklik uit die spysverteringskanaal geabsorbeer en versprei dan vinnig deur die liggaamsweefsels om infeksie te bestry.

Steclin–V word goed verdra, en veroorsaak minimumprikkeling in die ingewande.

Aangesien dit geen vrye natrium bevat nie, is daar geen kontra-indikasies vir die gebruik van *Steclin–V* in die geval van pasiënte wie se natriumopneming beperk moet word nie.

Indikasies: *Steclin–V* word aangedui vir die behandeling van talle gewone infeksies, insluitende infeksies van die asemhaling-, die spysvertering- en die geslagsurinêre stelsels wat op tetrasiklien-terapie reageer. Daar kan verwag word dat infeksies wat veroorsaak is deur Gram-positiewe en Gram-negatiewe bakterieë, spirochete, sekere groot virusse, sekere rickettsias en *Endamoeba histolytica* ook op behandeling met hierdie middel sal reageer. Weens die breë bestek van *Steclin–V* se mikrobebestrydende bedrywigheid, is dit besonder nuttig vir die behandeling van gemengde infeksies wat deur vatbare organismes veroorsaak word.

Dosis: Die aanbevole minimum-dosis vir volwassenes is een kapsule 4 maal per dag. Hoër dosisse, soos 2 kapsules 4 maal per dag, kan nodig wees in die geval van ernstige infeksies, of vir die soort wat nie op die kleiner dosis reageer nie. Die pediatriese dosis is 10 tot 20 mg. per pond liggaamsgewig per dag in verdeelde dosisse, na gelang van die tipe en die erns van die infeksie.

Die behandeling van alle pasiënte moet in die reël voortgesit word gedurende 'n tydperk van 24–48 uur nadat die simptome en koors bedaar het. Dit is egter raadsaam om streptokokki-infeksies gedurende 'n volle 10 dae te behandel om die ontwikkeling van rumatiekkoors te voorkom. Selfs langer terapie is nodig in die geval van subakute bakteriese hartvliesontsteking, en kan ook nodig

wees in die geval van sekere stafilokokki-infeksies.

Let Wel: As enige breëspektrum-antibioticum gebruik word, is dit nodig om die pasiënt sorgvuldig dop te hou vir tekens van sekondêre infeksie veroorsaak deur nie-vatbare organismes, veral *Candida albicans* (Monilia). Indien sodanige infeksies hul verskyning maak, moet die *Steclin–V*-terapie gestaak en ander geskikte maatreëls getref word. Moniliase kan behandel of voorkom word met behulp van *Mycostatin* (Squibb Nystatin).

Beskikbaarstelling: *Steclin–V*-kapsules, elk bevattende tetrasiklienfosfaat-kompleks gelykstaande aan 250 mg. tetrasiklienhidrochloried, word beskikbaar gestel in bottels van 16 en 100.

PREPARATIONS AND APPLIANCES

STECLIN–V

SQUIBB TETRACYCLINE PHOSPHATE COMPLEX

Steclin–V is the new phosphate complex of tetracycline, providing faster and higher initial blood levels for rapid, well tolerated and fully effective broad spectrum antibiotic therapy. Each *Steclin–V* capsule contains tetracycline phosphate complex equivalent to 250 mg. tetracycline hydrochloride.

Action: *Steclin–V* has pronounced anti-microbial activity against a wide range of pathogenic organisms including gram-positive and gram-negative bacteria, spirochaetes, certain large viruses, certain rickettsias and *Endamoeba histolytica*.

Advantages: *Steclin–V* produces faster and higher initial antibiotic blood levels than are attainable with older forms of tetracycline. It is readily absorbed from the gastro-intestinal tract and diffuses rapidly into body tissues to combat infection.

Steclin–V is especially well tolerated and causes a minimum of irritation in the intestine.

Since it contains no free sodium, *Steclin–V* is not contra-indicated for the patient whose sodium intake must be restricted.

Indications: *Steclin–V* is indicated for the many common infections, including those of the respiratory, gastro-intestinal and genito-urinary systems, which are amenable to tetracycline therapy. Infections caused by gram-positive and gram-negative bacteria, spirochaetes, certain large viruses, certain rickettsias and *Endamoeba histolytica* can be expected to respond. Because of its wide range of antimicrobial activity, *Steclin–V* is particularly useful in the treatment of mixed infections due to susceptible organisms.

Dosage: The suggested minimum adult dosage is one capsule 4 times daily. Higher dosages, such as 2 capsules 4 times daily, may be required for severe infections or for those which do not respond to the smaller dose. The pediatric dosage should be 10 to 20 mg. per pound of body weight each day, in divided doses, depending upon the type and severity of the infection.

Treatment for all patients should generally continue for 24–48 hours after symptoms and fever subside. However, it is advisable to treat streptococcal infections for a full 10 days to prevent the development of rheumatic fever. Even more prolonged therapy is necessary for subacute bacterial endocarditis and may be required in certain staphylococcal infections.

Note: With the use of any broad spectrum antibiotic the patient should be carefully watched for signs of secondary infection caused by non-susceptible organisms, particularly *Candida albicans* (Monilia). If such infections appear, *Steclin–V* should be discontinued and other appropriate measures taken. Moniliasis may be treated or prevented with *Mycostatin* (Squibb Nystatin).

Supply: *Steclin–V* capsules, each containing tetracycline phosphate complex equivalent to 250 mg. of tetracycline hydrochloride, are supplied in bottles of 16 and 100.

REVIEWS OF BOOKS

FOOD ADDITIVES

General Principles Governing the Use of Food Additives: First Report of the Joint FAO/WHO Expert Committee on Food Additives. World Health Organization: Technical Report Series, 1957, No. 129. Pp. 22. 1s. 9d. Pretoria: Van Schaik's Bookstore (Pty.) Ltd., P.O. Box 724.

The addition to foods on an ever-increasing scale of non-nutritive chemicals intended to improve their appearance, taste, consistency or keeping properties—chemicals for which it has been agreed to use the term 'food additives'—has faced the public authorities with the responsibility of defining the limits within which such additives can be authorized. An initial conference, convened by FAO and WHO in September 1955, carried out exploratory work in this field and suggested that an expert committee concerned with the technical and administrative aspects of the question be convened to formulate general principles on the use of these substances.

According to the report of this Committee, the use of a food additive is justified when it serves to maintain the nutritional quality of a food, to enhance its keeping quality or stability with resulting reduction in food wastage, or to make it more attractive to the consumer, or when such use is technically indispensable in food processing. The use of these substances should be prohibited when the aim is to disguise the effects of faulty processing and handling techniques or to deceive the consumer, when such substances decrease the nutritive value of the food, or when the desired effect could equally well be obtained by other and satisfactory practices.

The experts paid particular attention to the problem of protecting the consumer. In this connexion the safety for use of an additive is an all-important consideration. Authorization to use any additive should always be based on the considered judgement of qualified scientists that the intake of the additive will be substantially below any level which could be harmful. Furthermore, permitted additives should be subjected to continuing observation for possible deleterious effects under changing conditions of use. Finally, the consumer should be informed of the presence of an additive in a foodstuff, e.g. by means of a declaration on the packing.

Other questions connected with the use of food additives are also considered in this report, includ-

ing the restriction of the use of such substances in certain classes of food, limitation on levels of use, the need for specifications of identity, possible combined effects of food additives, the procedure to be followed for the authorization of additives, and a control system. The report also includes a certain number of recommendations to FAO and WHO.

PUBLIC HEALTH LABORATORY SERVICES

The Public Health Laboratory Service. First Report of the Expert Committee on Health Laboratory Methods. World Health Organization: Technical Report Series, 1957, No. 128; Pp. 40. 1s. 9d.

The public health laboratory is now recognized to be indispensable in preventive or therapeutic campaigns against communicable diseases, and its value is greatly enhanced when the bacteriological work in the laboratory is linked to epidemiological work in the field. In the first *Report* of the Expert Committee on Health Laboratory Methods, the role and organization of a public health laboratory service are considered and special attention is paid to the problems confronting under-developed countries, many of which are just starting laboratory work and are in need of expert advice.

Before a public health laboratory service is started in an under-developed country, it is well first to obtain a clear picture of the nature and extent of the infections and communicable diseases which will have to be combated. Ideally, epidemiological services should be developed ' in symbiosis ' with public health laboratory services, or even form part of them.

The Expert Committee did not attempt to give any definitive account of the structure and function of the public health laboratory service, for these will inevitably vary according to the needs and circumstances of each country. However, a variety of elements was considered, including medical microbiology and serology, sanitary bacteriology, epidemiological investigations, preparation and distribution of diagnostic reagents and of prophylactic materials, and research. In the better developed countries the main organizational features of a public health laboratory service are generally a central laboratory, which acts as the parent institution and is the administrative headquarters; reference laboratories; district laboratories; mobile laboratories carrying out examinations of specimens which cannot be sent to the district laboratory; and clinical side-rooms in which simple diagnostic tests may be made. Each of these elements should have some degree of autonomy, but they should all direct their efforts to the common goal of preventing disease.

The Committee also carefully studied the question of staffing and laid great stress on the importance of providing a well-qualified staff for the service and encouraging the training of local technical staff from the very outset.

An *Annexure* to the report gives a brief description of the existing public health laboratory services in certain countries, including the Union of South Africa. It should be added that an ante-natal Rh service is provided for the whole of this country, without charge, by the South African Blood Transfusion Service, Johannesburg.

THE VISUAL FIELDS

The Visual Fields: A Textbook and Atlas of Clinical Perimetry. By David O. Harrington, A.B., M.D., F.A.C.S. 1956. (Pp. 310 + Index. With 234 Illustrations and 9 colour plates. £6 16s. 0d.). St. Louis: The C. V. Mosby Company.

The study of the visual field is of great antiquity. Ptolemy was already occupied with its measurement in 50 A.D. in Alexandria. Mariotte's description of the blind spot of the field of vision came in 1668. It was soon applied by one of the English kings to a parlour game in which he painlessly decapitated royal favourites by placing them against the wall so that when he closed one eye the ' victim's ' head coincided with the blind spot of the other eye. The standard instruments for the study of the visual fields are the perimeter (introduced by Forster in 1862) and the tangent screen, derived from the work of Bjerrum, who first used the back of his consulting room door for this work (1889).

Of the many books on perimetry, a very good one is that of Dubois-Poulsen. A massive work of nearly 1,200 pages and available only in French, it is strictly for the enthusiastic professional. Harrington's book is likely to have more appeal for the ophthalmologist and neurologist in active practice. Harrington is a perimetrist in the classic tradition of Traquair, under whom he studied. He adopts Traquair's comparison of the visual field to an island of vision surrounded by a sea of blindness. As a modern American, he choses to view this island from a helicopter poised directly over the peak. The entire panorama of its surface is in view and, while objects on or near the summit are seen with greatest clarity, those on the plateau must be larger to be visible.

Harrington's description of standard perimetric techniques is masterly, while his chapter on special techniques is of great interest. The latter includes Bender's application to visual field study of the method of simultaneous double stimulation for the purpose of eliciting the extinction phenomenon. Extinction of sensation is defined as a process in which a sensation disappears or a stimulus becomes imperceptible when another sensation is evoked by simultaneous stimulation elsewhere in the sensory field. The process was already known to Hippocrates.

Another special technique is perimetry with ultraviolet radiation and luminescent test objects. This helps to eliminate distraction and so increases the accuracy of perimetry by eliciting more precise responses from the patient. A technique developed by the author is the multiple pattern method of visual field examination. It utilizes the principle of flash presentation of simple abstract patterns of lines, dots and crosses to the fixing eye and allows the rapid testing of the visual fields of both eyes in 3–4 minutes.

It is said that the city of the Hague has a bird picture for nearly every page of print, a factor which increases the clarity of the text. Harrington's *Visual Fields* is of great value and is likely to popularize and advance the science of perimetry.

PAEDIATRICS FOR NURSES

The Essentials of Paediatrics for Nurses. By I. Kessel, M.B., B.Ch., M.R.C.P. (Lond.), M.R.C.P. (Edin.), D.C.H. (Eng.). 1957. 1st ed. (Pp. 204 + Index. Illustrated. 21s. 0d.). Edinburgh and London: E. & S. Livingstone Ltd.

This book does not attempt to describe nursing procedures in relation to sick children, but sets out to give the nurse an understanding of the basic principles underlying the various conditions likely to be encountered in paediatric wards.

The author has presented his material in a clear and concise form and the illustrations are numerous. This book should be of value to senior nurses seeking additional information about the diseases from which their patients are suffering but is possibly a little too detailed for the requirements of the average nurse.

Useful practical points are to be found in the chapters on infant feeding and common poisonings in childhood.

TUBERCULOSIS AND BCG VACCINE

Advances in Tuberculosis Research: BCG—A Discussion of its Use and Application. Edited by Dr. Hans Birkhaüser and Dr. Hubert Bloch. Vol. 8. 1957. (Pp. 316 + Index. Illustrated. 60s.). Oxford: Blackwell Scientific Publications.

In view of the controversial experimental findings resulting from the use of BCG in millions of children and adults all over the world, this review of some of the problems encountered is of great interest. In contrast to most other vaccination procedures, there is still no standard preparation for BCG, nor is there a generally accepted vaccination technique.

Myers feels that BCG has been given undeserved credit and states that the most phenomenal accomplishments in the world have been achieved in those places where little or no BCG has been used, including Iceland, Hawaii and the Netherlands. In Scandinavia, where outstanding results have been achieved, the same fundamental methods, which alone brought about these results e'sewhere, have been employed together with the BCG vaccine.

Myers states also that the tremendous value of the tuberculin test in the early and specific diagnosis of tuberculosis and in determining the true magnitude of the tuberculosis problem in any area, is lost, once the authorities concerned embark upon a large scale BCG campaign. A mass BCG campaign not only gives the recipients an unjustified sense of security, but also hinders early diagnosis, particularly amongst medical students, doctors and nurses.

The numerous problems set out and discussed in this volume are of the greatest importance to all those responsible for the control and treatment of tuberculosis, and no worker in this field should fail to read it.

BIOLOGICAL STANDARDIZATION

Expert Committee on Biological Standardization, Tenth Report. World Health Organization: Technical Report Series, 1957, No. 127, 35 pages. 1s. 9d. Pretoria: Van Schaik's Bookstore (Pty.) Ltd., P.O. Box 724.

At its tenth session, the Expert Committee on Biological Standardization authorized the establishment of international standards, as well as the assignment of international units, for the following substances: (1) pertussis vaccine; (2) diphtheria antitoxin for flocculation test (fourth standard); (3) gas gangrene antitoxin (*vibrion septique*) (third standard); (4) streptomycin (second standard); (5) tetracycline; (6) erythromycin; (7) oxytocic, vasopressor and antidiuretic substances (third standard; previously called: posterior pituitary lobe); (8) prolactin (second standard); (9) insulin (fourth standard); (10) dextran sulphate; (11) heparin (second standard); (12) vitamin B_{12}. It also authorizes the establishment of the third international reference preparation of cardiolipin.

The Committee decided that there should no longer be international standards for provitamin A, vitamin B_1, vitamin C and vitamin E, and offered the remaining stocks of these materials, together with some other substances for which the standards had already been discarded, to the Expert Committee on the International Pharmacopoeia, for inclusion in the Collection of Authentic Chemical Substances held at Stockholm. It was also decided that the international standard for staphylococcus-β antitoxin would not be replaced and that its routine distribution would be discontinued.

Among other substances mentioned in the report, on which work is in progress towards the establishment of international standards or reference preparations are: typhoid, rabies, smallpox and swine erysipelas vaccines; antivenins; antistreptolysin O; blood-typing sera, poliomyelitis sera; typhoid and paratyphoid agglutinating sera; syphilitic human serum; neomycin; phenomethylpenicillin; procaine benzylpenicillin in oil with aluminium monostearate (PAM); and pyrogens.

An *Annexure* to the report contains an up-to-date list of the existing international biological standards and reference preparations, giving particulars of date of establishment, unitage, and form in which the standard is dispensed, as well as numerous bibliographical references.

PLASTIC SURGERY

The Principles and Art of Plastic Surgery. By Sir Harold Gillies, *C.B.E.*, F.R.C.S. and D. Ralph Millard, Jr., M.D. With a *Foreword* by Jerome Pierce Webster, M.D. In two volumes; 2,472 illustrations, 122 in colour. £12 10s. 0d. *net* per set; carriage and packing, 4s. extra. 1957. London: Butterworths.

This remarkable contribution to plastic surgery is, as the publishers point out, not only a textbook, but also a biography of a world-famous surgeon. The experience of a distinguished lifetime in the practice of plastic surgery has gone to the making of this *opus*, and no brief description can do justice either to the astonishing achievements which it records, the freshness of approach and the witty and original manner in which both hard medical fact and personal anecdote are set forth.

The literary presentation is reflected in the *Table of Contents*, which reads as follows:

The First Act: Cinderella Surgery. World War One; Principles; Anaesthesia (by Van W. Magill, *D.A., C.V.O.*); Technical Tips; Skin Grafting; Inlay Grafting.

Flap Happy. Rotation Flaps; Direct Flaps; Tube Pedicles; Lymphoedema; Forehead Flaps.

Mostly Congenital. Pigmented Naevus; Haemangioma; Radiation Burns; Cancer; Ear Making; Harelip and Cleft Palate; Rag Bag; Genitalia.

Trauma in War and Peace. World War Two and Rooksdown House; Burns; An Aspect of Hand Surgery; Lip Trauma; Surgery of the Mandible; Surgery of the Maxilla; Fractures of the Malar–Zygomatic Compound; Nasal Fractures; Frontal Defects; Eyelids and Sockets; Facial Paralysis; Cross Grafting.

Final Scene. A Day in Clinic.

Prof. J. P. Webster has written a *Foreword* which succinctly sets out the scope and quality of this milestone in the history of surgery:

'A plastic surgeon reading this fascinatingly vivid work feels himself in the presence of a master, sitting at his side, and almost hearing his voice review the stories, clinical and personal, of myriads of patients. All that goes into making the surgeon's profession a book of life is here in abundance: a compilation of hundreds of cases gathered over the years, with their thousands of hours of patient work at the operating table, on the wards, and in the consulting room, and with their human touches of drama, both comedy and tragedy. Technics are described, results of a wide gamut of procedures are shown, the pros and cons of controversial points are debated, but above all this work has colour, life and freshness. Pedantry is absent, and creative teaching stimulates the reader to new and wider vistas.

'The interest of this book to plastic surgeons is three-fold. It is a textbook of plastic surgery unique in its humanness; it covers to a large extent the development of plastic surgery during the twentieth century, when the greatest advances in this specialty have been made and the largest number of patients have been restored: and it is an autobiography of the outstanding plastic surgeon of the century, whose influence has been felt throughout the world and will continue to be felt for years to come. These are volumes which every man who attempts to do plastic surgery should own'.

CORRESPONDENCE

ORAL ANTI-DIABETIC TREATMENT

To the Editor: Your Editorial on *Oral Anti-Diabetic Treatment* (12 October 1957) is a genuine synopsis of this intriguing clinical problem the solution to which has long been a challenge in the field of pharmaceutical research.

There can no longer be any doubt that the new sulphonylurea therapy (Tolbutamide), although no complete answer to the problems of diabetes, is the logical conclusion of a series of attempts to cope with at least some aspects of a complex disease.

The number of clinical reports published, of practitioners prescribing Tolbutamide, and patients being successfully controlled on it, is constantly increasing.

Although it was clearly not the purpose of your Editorial to draw up a complete reference list of all publications on the subject, your readers may be interested in some additional data.

In the U.S.A., the number of cases treated with the sulphonylurea compound D–860, and relating to fully completed and further observed case histories, at the completion of the trials in 35 large U.S. hospitals, was 7,149.

In the U.K. the trials have not been carried out on the same scale as in the U.S.A., and total figures have not been compiled. From various isolated clinical reports published in the *British Medical Journal* and the *Lancet*, it would appear, however, that more than 500 cases have so far been followed up, most of the trial work having been done at the Edinburgh University Clinic.

On the European Continent, from Germany, the latest available figures suggest that hitherto more than 2,000 cases have been compiled and published (Stoetter *et al.* (1957): Deutsch. Med. Wchschr., **82,** No. 36, 6 September).

A. Prinz,
Scientific Adviser,
Farbwerke Hoechst A.G.

P.O. Box 1871,
Johannesburg.

ALLOCATION OF HOSPITAL BEDS

To the Editor: What rules of procedure, or ethics, decide the allocation of hospital beds?

I ask this because there recently came to consult me a Native, feverish, wasted, ill-looking, suffering from skin lesions of pellagra as severe as any I have yet seen, and so ill that I considered him not fit to walk the 10 miles to the nearest hospital, but sent for an ambulance to carry him there.

The disease had not yet progressed to the stage where intestinal or mental symptoms were evident and I felt that here was a case that a short, intensive treatment in hospital could rehabilitate completely. He would be one of those rare and gratifying cases in which the diagnosis was unequivocal, in which treatment would seem to work miracles and of whose stay in hospital not one moment would be wasted.

So I called the ambulance and sent him to hospital. The next morning he turned up at my surgery exhausted. He had been given some pills and told to go home, and walked all the way back, sleeping in a brickfield when night overtook him.

I telephoned the Casualty Officer who had turned him away and asked why. 'Beds,' I was told. 'We are short of beds. He arrived on Friday and we had to keep the few unoccupied beds we had for the expected week-end casualties.'

Who are the week-end casualties? They are the drunks and loafers, thugs and knife-stickers, skokiaan addicts and dagga smokers, tsotsis and prostitutes who frequent the shebeens on the smallholdings in these parts.

Where is the man now? I presume he has gone back to where he came from, a Provincial road-builders' camp; back to work, back to his inadequate diet to qualify for the irreversible physical and mental changes which invariably happen when the vitamin nicotinamide is withheld from the maize eater for sufficiently long.

H. J. Leviseur, M.R.C.S., L.R.C.P.

P.O. Box 40,
Honeydew.